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PROBLEMS OF NAVAL WARFARE UNDER CLIMATIC EXTREMES*

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PART I.—LECTURE I

In these lectures an attempt will be made to show how medical research, especially during this war, has assisted the Royal Navy in its function of engaging the enemy in every type of climate. My task is rendered difficult by the fact that for considerations of security one is debarred from referring to the very numerous and important researches which have been prosecuted since the war began. These lectures, therefore, stripped of the names and labours of the many research workers in Australia and the United States, as well as at home—especially in the Medical Research Council—will appear, for that reason, bald, discursive, and unscientific. The full story cannot yet be told.

Prevention of tropical and cold-weather disorders will not be discussed, for it is intended to concentrate on three climatic aspects of naval medicine—namely, (1) naval construction; (2) clothing; and (3) efficiency. Under the first heading will be discussed how naval architects enable a ship's company to tolerate both high and low temperatures. This section will also deal with such problems as the cooling of ships, ventilation, and, in short, general habitability. The second heading will concern the modern science of clothing as an ideal means of protection against environment—"ideal" when one is mindful of the Service restrictions imposed by considerations of appearance, ruggedness, and economy in bulk. Lastly, one will discuss the impairment of efficiency under unpropitious environmental conditions; the subtle ill effects which are attributed to long service in polar or tropical waters; the selection of those best fitted to stand up to Arctic or tropical service, and the early identification of those inherently unsuited for duty under such stresses.

On looking back over naval medical history, it is clear that the sea-surgeons of Great Britain during the eighteenth century were in many respects well ahead of their colleagues ashore and that their observations were pioneer efforts in preventive medicine. But in the nineteenth century the French marine was conspicuous not only in the early adoption of steam and of ironclads but by reason of its hygienists. One recalls the excellent work of Fonssagrives and of Méricourt in this connexion and their great interest in the increasing problems of ventilation. But, all along, naval medicine can be visualized as the closest approximation to what we now choose to call social medicine, for in the Service the total environment of our personnel comes under the closest study and care of the medical branch.

NAVAL CONSTRUCTION

Ventilation has always constituted a difficult problem in ship construction. In the early days seamen relied upon natural ventilation, which later was made to supply spaces below decks by means of wind-sails and scoops, down-take shafts or "aspiratories," to which was afterwards added a system of uptakes. Artificial ventilation eventually becomes imperative. While Desagulier's fans were being installed in the House of Commons in 1734, attention was drawn to the heavy sickness rate in the fleet at Spithead. To combat this it was suggested that the Desagulier system should be incorporated within one of the ships, but the idea was turned down by the Naval Surveyor.

About that time a Mr. Sutton became interested in marine ventilation, but could not secure the sympathy of the authorities. "*I particularly remember,*" he wrote, "*that being at a coffee-house near the Admiralty, I placed myself nigh some gentlemen of the Navy, and inquired of them, as I had before of others, as to the usefulness of a change of air; all, to a man, acknowledged it would be of the utmost service. I told them I could procure it; upon which one of the company went to another table and the rest followed him; and I heard him tell the others that he heartily pitied me, as being really mad and out of my senses.*" Within a few years, however, Hales's bellows ("ship's lungs") were used to circulate air throughout naval vessels. Various other mechanical systems were tried, including some which worked automatically with the roll of the ship. By 1873 the plenum principle had been introduced into monitors, and though reported upon unfavourably by Surgeon McCarthy, became adopted as the basic scheme for ventilation throughout ships of the Royal Navy.

It is obvious that both naval and civil engineers were preoccupied at that time with the question of odours from stagnant water in the bilges and vitiation of the air from animal exhalations and fumes and gases of various sorts. Later they spoke in terms of CO_2. Only to a lesser degree was humidity considered, while the temperature of the environment was rarely, if ever, discussed.

Ventilation

The 1910 conference on tuberculosis in the Royal Navy led to an Admiralty Committee on Ventilation, which submitted its final recommendations in 1914. A minimum supply of 3,000 cu. ft. of air per man per hour was required. As an index of adequacy of air supply it was enacted that samples of air from any living-space must always contain less than 0.12% CO_2. Cubic space should not be less than 20 cu. ft. per man in sleeping-spaces, with a gap of not less than 20 in. between hammocks. A temperature of 55 to 60° F. was aimed at for living-spaces in cold weather. But the inter-wartime period was one of great mechanical achievement, so that the expansion in both matériel and personnel always outpaced the adequacy of air supply. It was evident that some of the standards set could not in practice be attained. In 1937 it became necessary to appoint a further Ventilation Commission. As the desired 3,000 cu. ft./man/hr. had proved unattainable, they tried for a standard 2,000 cu. ft., insisting that the volume should never be less than 1,500 cu. ft./man/hr. (i.e., a change of air every five minutes). They found it impracticable to lay down a definite minimum cubic space per man in sleeping-quarters, but advised that there should be a distance of at least three feet between the mouths of the sleepers. This could be obtained in the case of hammocks by slinging alternately head to foot. The use of punkah louvres, which had gradually come about since 1912, was approved; but for cold weather (when the openings were often sealed), an additional relief vent, suitably baffled, was suggested. Mess-deck temperatures of between 60 and 65° F. were recommended for cold climates. The committee was concerned with the obvious inefficiency observed in cordite-handers under action conditions during the Mediterranean summer and the improvement when

* Being the Croonian Lectures delivered to the Royal College of Physicians, July 10 and 12, 1945.

coolers were installed. The inference, however, was that cordite fumes were responsible, and coolers were advised only as an interim measure until some kind of non-porous containers for the cordite charges could be issued. Air-conditioning was discussed and was envisaged as beneficial, but, because of size, weight, and cost of the plant, was not regarded as an essential requirement.

With the onset of this war the recommendations of the second committee became out of date. Conditions within living- and working-spaces changed for the worse. All ships now carry a complement far exceeding the original design, in some cases by as much as 60%. Ships remain at sea for inordinate periods, and operational needs dispatch them to regions where extremes of climate add to the discomforts, unlike the peacetime cruising practice. Darkening ship demands a sealing of all scuttles after nightfall. The menace of air attack necessitates additional high-angle armament and radar equipment, which all means more men. Dangers of fire led to the removal of woodwork, and hence the sacrifice of the lagging or insulating lining of the ship's sides. (This is a practice which has come and gone according to the fluctuating policies of the last 60 years at least.) Finally, the risk of losing the vessel from rapid flooding after enemy action has been met by an elaborate system of "damage control" whereby the ship, immediately action is joined, is divided into a large number of air-tight and water-tight compartments. As soon as a ship enters dangerous waters it is battened down and hermetically sealed, the personnel standing by at first or second degrees of readiness. Ventilation suffers drastically. Indeed, in some compartments, such as the magazines and shell-handing rooms, circulation of air ceases. A steady rise of temperature follows, which in the Tropics may attain potentially dangerous levels.

Hence there arises a clash between two conflicting policies. On the one hand there is the operational need for keeping a ship afloat even after severe underwater damage. To effect this, damage control aims at converting the ship into something like a honeycomb. On the other hand there is the hygienist's concern over the personnel and their discomforts, the menace to their health, and the toll on their fighting efficiency.

First among the defects of habitability that accrue from battle conditions during this war are the *high temperatures* below deck, especially in the Tropics. Even in cold climates mess spaces tend to develop a temperature well above that outside, and a man coming off watch on the bridge passes from extreme cold to an atmosphere of hot, moist, and stagnant air. In the Tropics the conditions are worse. With an ambient air temperature of 85 to 100° F. (dry-bulb) the compartments where men work, eat, or sleep reach temperatures around 85 to 95° F. (wet-bulb). Consequently men strip except for shorts and sandals. Sweating continuously and profusely, most of them develop prickly heat, and often superadded septic or fungous infections.

Even more significant than raised temperature is *high humidity*. This feature may be conspicuous even in the Arctic, where the internal warmth, contrasting with the icy-cold uninsulated ship's sides, causes water of condensation to stream down on to the deck. Added to this is the moisture from wet duffel coats and oilskins which hang up to dry in the mess-decks. The question of humidity has exercised the medical branch for years, for cleanliness demanded frequent washing and holystoning of the decks, and this by evaporation produced a high water content of the air. To-day the question mainly turns on the lack of drying-spaces, with the result that wet garments are constantly hanging in places where men sleep. In the Arctic it is the wet top gear which is at fault; in the Tropics the shorts and singlets, which require at least daily dhobying.

Overcrowding from expansion in ships' complements may be endurable in the Arctic, as the heat engendered helps to warm the air. But in the Tropics it is a serious matter, affecting comfort as well as health. The cubic capacity allotted to a man may be far below the old minimum standard of 200 cu. ft. As many as possible sleep on the weather-decks, but this is usually impracticable at sea. At action stations working-spaces are grossly congested, and gun turrets, radar and wireless cabinets, transmitter stations, and so on may be crowded with personnel on watch, standing by, or dozing.

In cold climates there is the problem of *exposure* of watchkeepers. Men on look-out, on the bridge, or in control tops may be unprotected against driving sleet, high winds, and temperatures far below zero. How to keep alive—let alone alert—is not an easy problem.

All these are medical considerations which tie up with inadequacies in ship construction. Though far from novel, most have been greatly increased by the changing trends in modern naval warfare. That is why no serious attempt has been made to correct these defects until recently.

To investigate the problems in the widest fashion, and to justify any sweeping changes which may seem called for in the construction or ventilation of fighting-ships, the Admiralty in 1943 requested the R.N. Personnel Research Committee to appoint a Habitability Subcommittee. At once gaps in our knowledge became evident. There is the question of whether efficiency falls as environmental temperature and humidity rise, and of whether any such change is a progressive one. It was actually quite difficult to furnish the required answers or to make recommendations. The wide ranges of climate mean that naval engineers would have to raise the interior temperatures considerably in the Arctic, and lower them—if possible—in the Tropics, in order to maintain the efficiency of the personnel. Too exacting requirements on the part of the medical branch run the risk of being rejected out of hand as unreasonable. Moreover, there was the question of what we should use as a yardstick to measure habitability: should we speak in terms of dry- and wet-bulb temperatures, atmospheric humidity, katathermometer cooling power, or effective temperature?

This last seemed most promising, for it accords with modern ventilation practice, and embraces both dry- and wet-bulb readings and measurements of air movement. There are certain weaknesses, however, in the conception of effective temperature. It does not allow for acclimatization. It does not cater for men engaged in physical work. It is an empirical standard drawn up from the work of a relatively small series of Americans, whose ideas of environmental comfort might not be ours. Its validity in the higher ranges of temperature and air velocities has been impugned. The chief drawback is that it is inapplicable when there are sources of radiant heat—which actually is a characteristic feature in warships.

On the advice of Dr. T. Bedford, the Habitability Subcommittee has provisionally adopted Vernon's "globe thermometer" for use in ships, as it can be employed for measuring the radiant heat from the surroundings. Globe-thermometer readings, therefore, replace dry-bulb readings in the effective temperature charts, and the result is spoken of as "corrected effective temperature" or (C.E.T.).* Air velocities are determined by means of the silvered (high-temperature) dry katathermometer.

To comply with the standards of the Habitability Subcommittee for ships serving in the Tropics considerable changes might be required in the methods of ventilation. In new ships, and ships still on the stocks, drastic changes might be feasible, but in those already commissioned, and especially in the older ones, it is more a question of "patching up," as operational requirements take precedence and the ships cannot immediately be spared for dockyard hands. Some of the changes in mind could be made immediately; others would have to wait until the opportunity arose for a refit; others were still for the future.

The terms "tropicalization" and "arcticization" of ships are sometimes applied to the measures adopted to render vessels habitable in extremes of heat or cold. Though the methods are of recent origin, the idea is an old one. For many years special ships have been constructed for polar expeditions. "Tropicalization" would seem to be a newer conception, but we find the project being undertaken as long ago as 1740, when Commodore Anson made structural alterations in a squadron for the Pacific; and in 1841, when Dr. David B. Reid and Captain H. D. Trotter built ships for the Niger River exploration with extra ventilation and the introduction of "medicators."

* The effective temperature scale is referred to the standard conditions of still and saturated air, so that the effective temperature of an environment indicates the temperature of still air saturated with water vapour, in which an equivalent sensation of warmth was experienced in a long series of tests. When the reading of the globe thermometer is used to arrive at the corrected effective temperature (thus applying a more or less adequate correction for radiation) the standard of reference is an environment in which the air is still and saturated with water vapour, and in which the surrounding surfaces are at air temperature.

The *Victor Emmanuel* was the first hospital ship to be specially equipped for tropical service during the Ashanti War.

Air Conditioning

Chief among the items envisaged in modern tropicalization and arcticization are: the installation of air-conditioning plant; a return to the practice of lagging or sheathing; more extensive insulation of steam-pipes and other heat-producing machinery; reduction in C.E.T. by drying the air or by increasing air movement; the correction of the more obvious faults in the siting of intakes and exhausts (faults which had often resulted from structural alterations long after a ship's commissioning); and, finally, a general indoctrination of naval officers of all branches in matters pertaining to ventilation and habitability.

Air conditioning might appear at first sight to be the complete answer to all these problems, for incoming air is automatically cleansed, dried or moistened, warmed or cooled, as required. The problem bristles with difficulties, however. Air-conditioning plant is scarce, bulky, and heavy. Even were sufficient apparatus available for immediate installation, it would occupy so much space in a ship and add so much to the weight that fighting efficiency would suffer. Thus, to air condition a warship might require a great deal of extra weight and space—perhaps as much as a heavy gun and its turret—as well as several extra hands. This addition to an already congested ship means the sacrifice of some part of the existing offensive or defensive equipment. Whether such a policy is a business proposition which will pay dividends in the way of enhanced human efficiency is still a matter of conjecture rather than knowledge.

If one compromises by adopting air conditioning only in certain regions of a ship a fresh problem arises as to which spaces should be so equipped. Is it better to cool the working compartments (in order to ensure vigilance and accuracy) or the mess-decks (to afford a refreshing spell of sleep before the hands go on watch)?

There are other medical and paramedical problems. If air conditioning is to be the rule, what standards of temperature and humidity should be adopted with reference to the outer air? The phenomenon of "cold shock" is known to occur on passing abruptly from a tropical climate into a much cooler environment—as, for example, on entering a cold-storage room. An undue dryness of the inspired air is believed to produce an unhealthy state of the mucous membranes, as in the case of American railroad employees. Again, are ill effects to be expected from changing many times daily from one sort of environment to another? Thus, are upper respiratory infections facilitated by frequent changes from a hot humid to a relatively cool dry climate, or vice versa? What is the effect upon the process of acclimatization? Can it be that men conditioned to a tropical climate suffer as the result of a sojourn of some hours daily in an air-conditioned room?

Even more important is the risk that re-circulating air may increase the incidence of air-borne disease, quite apart from the possibility that an artificial climate may alter the virulence of droplet infections or the relative immunity of the occupants, or both. The use of chemical disinfectors or ultra-violet treatment of the incoming air needs careful thought.

Cooling or heating the incoming air may of course turn out not to be the ideal for naval purposes, and possibly the so-called "radiant reflective conditioning" might prove better. In this system the air is unaltered, but specially cooled (or heated) panels let into the bulkheads bring about the necessary thermal change in the occupants. This practice has not yet been tested in ships.

Some of these questions are, or will be, the subject of specific inquiry in our research laboratories in this country and those to be erected in the Tropics. Nevertheless we believe we have been justified in installing cooling plant in certain places in certain ships. As regards the temperatures at which they are maintained, we believe the tendency is to keep them too cool. It is rarely necessary, or indeed wise, to reduce them below an effective temperature of 78° F. (with a high outside temperature). An alternative ruling is to accept no more than 10° F. difference in temperature between the treated and the untreated air; or to adopt the Mayer-Fittz formula. The last word on this subject is still to be said.

Interim reports on air-conditioned compartments are most encouraging, though scientific data as to output and efficiency are not yet available.

Reducing the dry-bulb readings is only one way, of course, of lowering effective temperature, and something might be done in this direction either by decreasing the humidity or by increasing the movement of the air. The former can be brought about by means of various types of dehumidifiers or by silica gel desiccators. Both methods are used in the Service for the drying of certain compartments, and the practice has materially extended since the war. Both systems have drawbacks which prevent them from being adopted more generally, not the least being the fact that the act of withdrawing moisture from the air in itself generates heat.

Increasing the air movement is a much more practicable means of reducing effective temperature, and the improvement in comfort and efficiency is beyond what might be expected from the change in effective temperature. In H.M. Ships air movement is obtained below decks first by the blower system of ventilation and secondly by means of table, bracket, or punkah fans. In the blower system air is driven along trunks by means of electric fans and injected into the compartment by way of punkah louvres. This is in effect a miniature "spot-cooling" system, which on a larger scale proves so successful in making engine- and boiler-rooms tolerable despite the very high temperatures. In some locations—e.g., machinery spaces, galleys, heads—there is a forced-exhaust system, but elsewhere the peacetime practice was to rely upon natural means of exhaust—i.e., hatches and scuttles. Since this war, however, these natural vents are sealed.

The obvious way to improve habitability in ships under wartime conditions, especially in the Tropics, would be an increase of the air flow in volume and velocity. This would be an easier task than to cool the incoming tropical air to tolerable levels. Greater air movement could be obtained by increasing the size, the number, and the speed of fans in the trunkings; by providing more table, bracket, or punkah fans; and by installing exhaust fans in those compartments which used to rely on natural vents.

Other Methods of Increasing Habitability

Other methods of increasing the habitability of ships in climatic extremes may be mentioned briefly. The great sources of wild heat must be shut off from the rest of the ship by means of thermal insulation. The risk of fire precludes the use of wood except to a limited extent. Newer insulating materials have been introduced with various advantages. Hawkyns used a layer of tar and hair between two layers of wood—a practice which lasted till the end of the eighteenth century. The aluminium foil which is the most usual intermediate layer can now be replaced by far lighter plastics which are non-inflammable. These plastics still require an inner sheathing, however. A more extensive use of cork would combine the properties of thermal insulation with protection against the spread of fire. One of the most difficult regions of a ship to render habitable is a gun turret, which in the Arctic is bitterly cold, with its masses of steel and its water of condensation, and which in the Tropics is almost intolerable by reason of solar radiation. An attempt at a solution of the problem lies in the use of layers of cork inside the turret.

The sheathing of steam-pipes is being improved, especially where they traverse mess-decks. Steam leads, which add so much to the atmospheric humidity below decks, require stricter sealing.

The choice of appropriate colours in painting the hull and superstructure of ships is a problem of camouflage, but it has a medical bearing also. In the Tropics white paint reflects solar radiation best of all, while black absorbs most heat. Black pigments do not all behave alike, however, and radiation studies reveal that the composition of the paint may be as important as the colour as regards its reflection and absorption of infra-red radiation. Thus aluminium paints are the most efficient reflectors of the sun's rays.

Artificial lighting of the mess-decks contributes to the final temperature. Two 60-watt lamps produce rather more heat than one resting man. It is possible that fluorescent lighting might render a mess-deck cooler in the Tropics. Modern improvements do away with the disadvantage of the former feeling of the blue colour.

There is also the point whether the colour of the sides of the mess-deck has any effect upon the *feeling* of warmth or of coolness, even though this may operate through suggestion only. It has been the tradition to paint the interior of sick-bays a pale green in tropical-going ships. F. C. Houghton, H. T. Olson, and J. Suciu found no objective change in skin temperatures in different coloured environments, but they affirmed that occupants might experience a subjective sense of warmth or of coolness in the presence of this colour or that—which, from the human standpoint, is significant.

Body-cooling in hot atmospheres may be obtained by adequate draughts of cold water : in any event the need for drinking, over and above the call of thirst alone, is important for maintaining mental and physical efficiency in high temperatures. There is a rationale, therefore, for supplying cooled drinking-water in working- and living-spaces, though the American habit of iced water may not be a physiological ideal. Whether the water should contain salt or oatmeal needs closer investigation.

Lastly, the innovation of laundries in H.M. Ships has much to recommend it, not only because they promote cleanliness (and so avert skin infection) and avoid the wearing of sweaty garments (which aggravates prickly heat), but chiefly because they abolish wet garments from the mess-decks. There is the point, too, that sweat-soaked garments will not readily dry except in an atmosphere of extreme desiccation—a condition which does not obtain in the mess-decks.

(These lectures will be continued in the issue of Aug. 11 and completed in that of Aug. 18)

BACTERICIDAL EFFECT OF MIXTURES OF ETHYL ALCOHOL AND WATER

WITH SPECIAL REFERENCE TO STERILIZATION OF THE SKIN, AND A NOTE ON THE COMPARABLE EFFECTS OF ETHER

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Although much work has been done by a number of observers on the antibacterial effects of alcohol on the one hand and on the value of various substances as sterilizing agents for use on the skin on the other, agreement would appear not to have been reached regarding the optimal dilution of alcohol for use on the skin before puncture or surgical incision. Precision on two points is necessary for a final assessment : first, percentages of alcohol in water should be accurately defined in respect of any observations made ; and, secondly, the requirements of a fluid for use on the skin should be considered in terms of its physical properties as well as its bactericidal power. Further, due consideration must be given to the bacterial species which it is most necessary to eliminate.

Percentages of Alcohol

For scientific accuracy it is probably desirable that the strength of an alcohol mixture should be recorded as percentage by weight. On the other hand, under ordinary conditions the preparation of volumetric percentages can more readily be carried out. There are appreciable differences in the strength of mixtures produced by (*a*) making up a measured volume of alcohol to a total volume by the addition of water ; (*b*) making up a measured volume of water to a total volume by the addition of alcohol ; and (*c*) mixed measured volumes of the two fluids. These differences are due to concentration during admixture. The *first* is the correct percentage by volume. The following figures, calculated from tables given in *The Chemists' Year Book, 1942*, illustrate the differences in strength between solutions made up by the methods referred to :

(1) 76% by weight is approximately equal to 82% by volume, at 60° F.
(2) 70% " " " " 77% " " "
(3) A mixture made by making up 30 parts of water to 100 parts by the addition of alcohol is approximately equal to 73% by volume.
(4) A mixture made by the addition of 30 parts of water and 70 parts of alcohol is approximately equal to 72.5% by volume.

Physical Properties of Alcohol-and-Water Mixtures

From a practical point of view *surface tension* is probably among the most important variable characteristics of alcohol-and-water mixtures. It is likely that low surface tension is the factor mainly responsible for the improved spread (Bonney and Allen, 1944), penetration (Lovell, 1945), and complete wetting observed when alcohol is used on the skin. The variation in surface tension which occurs as alcohol is progressively diluted with water is illustrated by the following experiments. It was also apparent in some of the experiments on plates of solid media referred to later in this paper.

Experiment A

Mixtures of water and alcohol of 65 volumes of alcohol and 35 volumes of water, and of 30 volumes alcohol and 70 volumes of water respectively, were dropped from a Dreyer's pipette on to a porcelain tile which had been rubbed over with Congo-red powder. The diameters of the circles of spread of the alcohol were measured and the volume of the drops calculated by counting the drops in 0.5 c.cm. The mean diameter of the area wetted by the drop of the stronger mixture was 2.7 cm. (mean of 10 observations), while the mean volume of the drop was 16.6 c.mm. The figures for the weaker alcoholic mixture were 2.05 cm. (mean of 10 observations) and 19.23 c.mm. respectively.

Experiment B

A somewhat more careful observation, using absolute alcohol and a mixture of 65 volumes of alcohol and 35 volumes of water respectively, was made by tracing the outline of the wetted areas produced on a similarly prepared tile, measuring the areas enclosed, and calculating the diameter. The drop volumes were obtained by measuring the volume of 200 drops of each strength of alcohol. In this experiment the mean diameter of the area wetted by 16.375 c.mm. drops of absolute alcohol was 3.37 cm., while that of the area wetted by 17.625 c.mm. drops of "65%" alcohol was 2.85 cm.

Species of Pathogenic Bacteria Liable to be Found on the Skin

Bacteria encountered on the skin may be divided into "resident" and "transient" organisms. The former cannot be completely eliminated by any process which will not injure the tissues (Colebrook, 1941). Much of the "resident flora" is located in the pilonidal follicles ; these are not penetrated by 70% alcohol or by acetone (Lovell, 1945). According to Colebrook (1941) *Str. pyogenes, Proteus,* and *Ps. pyocyanea* are among the transient flora, and *Staph. pyogenes* is difficult to place, being intermediate between the transient and resident flora. He quotes various workers as finding *Staph. aureus (pyogenes)* on the skin of from 5% to 30% of normal individuals. Martin (1942) reports the occurrence of *Staph. aureus* on the face, wrist, and chest respectively in 38%, 24%, and 14% of normal individuals, the corresponding figures of *Str. pyogenes* being 5%, 3%, and 1%. Miles *et al.* (1944) report the skin carriage of *Staph. aureus* in 18.4% of individuals. Cruickshank *et al.* (1942) quote Lockemann *et al.* (1941) as finding *Staph. aureus* more resistant to all strengths of alcohol than either *Bact. coli* or *Ps. pyocyanea.*

It would thus seem that the power to kill *Staph. aureus* may be considered as a suitable index of the value of alcohol in skin sterilization. It should be noted, however, that, owing to the alcohol-fast nature of the genus *Mycobacterium,* alcohol may be expected to be inefficient as a bactericidal fluid for *M. tuberculosis.* It is possible, though hardly probable, that failure in this respect led to an accident following which the use of alcohol for sterilizing syringes for the administration of parenteral injections was condemned by Bigger *et al.* (1940), though these workers also showed that alcohol failed to destroy streptococci in sputum used to contaminate syringes in certain of their experiments.

Recommendations by Previous Observers regarding Suitable Strength of Alcohol

Where contact may be prolonged weak mixtures are effective. Cruickshank *et al.* (1942) have shown that *Staph. aureus, Bact. coli,* and *Ps. pyocyanea* may be destroyed in from 0.5 to 24 hours by 25% alcohol. The length of time necessary to achieve sterility in certain of their experiments shows that 25% is obviously an ineffective strength for use in skin sterilization, where contact of the reagent with the skin is limited by the volatile nature of alcohol and by considerations of practical

utility. These authors quote Minervini (1898), however, as having shown that the most germicidal concentration of alcohol is between 50% and 70%. Garrod and Keynes (1937) state that the optimum strength of alcohol is 70%. Bigger *et al.* (1940), while condemning the use of alcohol for sterilizing syringes as stated above, consider that a solution containing 70% alcohol has a much greater bactericidal action than the 95% spirit described as suitable by Lawrence (1940). The *British Medical Journal* (1940, **1**, 96) in a leading article quotes Regamey (1939) as finding that *Bact. coli* in broth culture was destroyed within 15 seconds by all concentrations of alcohol between 50% and 99%, and within one minute by 40%. *Silk threads* contaminated with *Bact. coli*, however, were sterilized in one minute only by concentrations of 50% and 60%; 70% took 3 minutes, 80% 15 minutes, while in 90% and 99% the organisms survived for 24 hours. Similar results were found with staphylococcus and streptococcus, except that the optimum concentration for staphylococcus was somewhat higher.

For use *on the skin* the following recommendations have been made from time to time:

95%: Hatfield and Lockwood (1943) found that the best results were obtained when 95% alcohol was used after *tincture of iodine*, but that consistently low counts were obtained after alcohol alone.

76% by weight: Colebrook (1941) reports the use of alcohol of this strength against streptococci on the skin—the streptococci were not completely eliminated.

70% by weight: Price (1939) is quoted by Colebrook as having shown that this is the most effective concentration of alcohol.

70% by volume: Has been recommended in certain official publications.

Various references to "70% spirit," "75% spirit," etc., may be found in the medical press and in commercial medical literature.

In the course of some unpublished work on skin disinfection (using *Staph. aureus* as an "indicator organism") carried out in 1941 by B. W. Lacey and myself, "industrial spirit" was used as a control in all experiments. This was very effective, but it was decided for the sake of completeness to carry out an *in vitro* test of the relative value of falling dilutions of alcohol. Method 1 of those given below was used, and results suggested that 65% was below the effective level for a period of exposure up to two minutes. 70% was not used.

Ether.—Ether is commonly applied to the skin as a part of the pre-operation toilet. It was found ineffective as a fluid for sterilizing syringes by Bigger *et al.* (1940), and its use as one of the reagents tested in the above-mentioned work by Lacey and myself suggested that its bactericidal effect when applied to the skin is inconsiderable.

Present Investigations

Purpose.—In view of the facts and considerations referred to above it was thought worth while to test yet again the *in vitro* effect of alcohol–water mixtures on *Staph. aureus* over a narrow time-range; to test the effect of such dilutions on the artificially contaminated skin; to compare the results obtained by different technical methods, and with different organisms; and to carry out a small series of parallel tests with ether. In all of the tests, unless otherwise stated, the dilutions used were made by mixing *measured volumes* of alcohol and water. They were thus slightly stronger than their nominal strength expressed as percentages by volume (see "Percentages of Alcohol" above).

Methods of Demonstrating Antibacterial Action Employed

1. *Glass Bead Method.*—Small unperforated glass beads as used in the "transfusion-giving set, hospital pattern," were placed in a thick suspension of organisms. They were then removed and dried. The dilutions of alcohol under test were poured on to sterile dishes, and a bead was placed in the mixture for a measured time; it was then transferred, with or without a preliminary washing in water, to sterile broth or to the surface of the agar in a Petri dish or covering one side of a 1-oz. screw-cap bottle. (When beads were transferred to the solid medium they were rolled freely about on the surface of the agar before incubation.) The media so inoculated were then incubated. A somewhat similar method—"Krönig and Paul's garnet method"—was employed by Hailer and Bockelberg (1939) in estimating the germicidal efficiency of the halogens on anthrax spores. In the course of the work it was found that washing of the alcohol-treated bead is necessary when it is to be used to inoculate a solid medium.

2. *Filter-paper Method.*—Small pieces of sterile filter-paper were immersed in a suspension of the organisms to be employed. After drying, these were placed in the spirit mixtures under test and after a noted interval transferred to bottles of broth, which were then incubated; or they were washed in water and placed on the surface of an agar plate, from which they were removed after a short time in the incubator, incubation of the plates being continued.

3. *Fluid Inoculum Method.*—A known volume of bacterial suspension was added to a known volume of the alcoholic mixtures under test. Drops of the resultant suspensions after shaking were then transferred, after an observed time of contact, to bottles of broth, which were subsequently plated and the plates incubated.

4. *Contaminated-finger Method.*—The fingers were contaminated by rubbing the tips over the surface of a plate culture. Individual fingers were then either (*a*) wiped with dry cotton-wool to spread the organisms further and remove excess, after which they were dipped for a moment in dilutions of alcohol; or (*b*) they were wiped with cotton-wool moistened with the alcohol dilutions. The fingers were then left until apparently dry, after which they were again wiped on fresh plates of a similar medium.

5. *Prevention of Growth on Inoculated Solid Media.*—Areas of plates of appropriate media were inoculated with the indicator organisms. When these areas were dry drops of the test dilutions of alcohol were delivered to the middle of each area with a Dreyer's pipette and the plates incubated when again dry. The use of blood-agar plates and *Str. pyogenes* as the test organism afforded an excellent "indicator" method, as the effective concentrations were made very obvious by the failure of haemolysis in the area of spread of the alcoholic drops. To exclude the possibility that failure of growth after the application of alcohol to an inoculated area might be due to destruction of the nutrient properties of the medium (Hayward and Miles, 1943; Cawston and Colebrook, 1943) rather than to death of the organisms, the following controls were incorporated in two of the experiments carried out on *Str. pyogenes* by this method.

Control A

The centres of the areas covered by the spread of the drops of various dilutions of alcohol used—from 100% to 40%—were reinoculated with the strain under test after the alcohol had dried. Growth occurred as a result of each such reinoculation.

Control B

Parts of the areas over which each alcoholic dilution had spread were cut out and placed, inoculated surface down, upon a fresh plate of blood agar. *Growth failed to occur* where contact was made between the fresh plate and the alcohol-treated part of the excised portion of medium. *Growth occurred* where the fresh plate was in contact with such an area of the cut-out piece as had not been covered by the alcohol.

Hence (*a*) the medium was not destroyed by such exposure to alcohol as the method entailed, (*b*) the organisms were killed by the alcohol in the strengths which led to failure of growth.

6. *Killing of a dried film of organisms on a slide by the application of drops of descending dilutions of alcohol;* as indicated by the failure of growth development when the treated slide is applied to the surface of a plate of medium and incubated.

Results

Method 1.—The results of four experiments using *Staph. pyogenes* showed that for periods of contact ranging from 5 seconds to 2 minutes 100% and 98% alcohol are highly ineffective and 95% is less bactericidal than mixtures containing more water. The effect of 50% alcohol is probably less than that of mixtures containing less water. The optimum range therefore would appear to be between 60% and 90%. Two experiments indicate that 60% and stronger mixtures of methyl alcohol are as effective as dilutions of ethyl alcohol in killing *Staph. pyogenes*. Single tests suggested that "industrial spirit" and methylated spirit (tinted violet) are effective against *Staph. pyogenes* in a range from full strength to 60% or weaker.

The results of these experiments do not confirm the failure to sterilize staphylococcus-contaminated beads by the use of 65% spirit found in the experiment carried out in 1941 and referred to above. The failure then observed may have been due to a technical error such as incorrect dilution of spirit or contamination during manipulation or to a fault inherent in the method, such as bubble formation or clumping of the organisms with fixation of the outer layer and lack of penetration to the middle of the clump. It is considered that bubble formation is a likely cause, since this would tend to become more frequent as surface tension rises with increasing dilutions of the alcohol. It was thought to be the cause of a completely irregular result when the method was tried with a watery disinfectant. Similar irregular results, though to a lesser degree, have occurred throughout the experiments here summarized. They rendered the method inaccurate, particularly in fluid media. It was therefore discontinued.

Method 2.—Two experiments were made using this method on *Staph. pyogenes*. The method was not found very satisfactory. The first experiment, in which the pieces of filter-paper were placed in broth alone, after 10 seconds' treatment in each case, produced only two sterile cultures—one after treatment with 95% alcohol, the other after 65% alcohol. With reference to the latter, however, it was realized at the time that, owing to a hitch, exposure had exceeded 10 seconds; the test with this dilution had been repeated, and in the second broth growth occurred. The second experiment indicated that absolute alcohol is inefficient, while 80% to 50% were all bactericidal in 30 seconds, as shown by sterile results of both fluid and plate culture. Culture after 10 seconds suggested that 80% was less effective than the weaker mixtures, of which 60% gave the best result.

Method 3.—Using *Staph. pyogenes* and *Str. pyogenes*, one experiment for each was carried out. In the case of the test on *Staph. pyogenes* there was no growth on subcultures from mixtures containing 95% to 47.5% of alcohol after one minute's contact. A heavy growth occurred on subculture of a mixture containing 30% of alcohol after a similar time, but this strength was bactericidal after 15 minutes' contact. *Str. pyogenes* subcultures from mixtures containing dilutions of alcohol from 95% to 38% showed no growth after 10, 30, and 60 seconds' contact.

In view of these findings it seemed desirable to make further observations on the artificially contaminated skin. Six such tests were made as shown under Method 4.

Method 4.—Four experiments using *Str. pyogenes* were carried out. Two of these were partially spoiled by contamination. The combined results, however, indicate that, though of considerable value, absolute alcohol, and probably 70% alcohol, are less effective than mixtures of intermediate strength, while 65% showed a definite comparative inefficiency. Two of these experiments were made with true volumetric percentage dilutions. Two similar series of tests, also using correct volumetric percentage mixtures, were made on fingers contaminated with *Staph. pyogenes*. 100% to 65% were apparently effective; 60% was not.

In view of the difference between the results obtained with Method 4 and those which followed the use of the first three methods it seemed desirable to compare these findings with the effects of similar strengths of alcohol on inoculated areas on a plate of solid medium—i.e., on a surface upon which, like the skin, a certain dilution effect due to absorbable water is liable to occur. (It should be mentioned that all this work was carried out in a tropical climate of high humidity. The skin was thus liable to be more moist than is normal in a temperate or cold climate.)

Method 5.—Three experiments on cultures of *Staph. pyogenes* (Oxford) were made. The third test was carried out in duplicate, and true percentage dilutions by volume were used. In all experiments the best result was observed with strengths above 80% (*including absolute alcohol*); deterioration in antibacterial effect was marked by the time a dilution of 65% was reached. Eight experiments were carried out on cultures of *Str. pyogenes*. In four experiments true volumetric dilutions were used. The results of these tests may be summarized as follows:

A complete failure of growth, though over a diminishing area, resulted when alcohol of strength varying from 100% to 70% was dropped on plates inoculated with *Str. pyogenes*. An almost equally good effect was generally produced by 65% alcohol: 50% alcohol and weaker mixtures were relatively ineffective. The following chance observation is of interest. In one experiment the streptococcal culture used as an inoculum became contaminated with an organism giving a lemon-yellow colony on agar. Colonies of this contaminant appeared in considerable numbers in areas inoculated for the test and, while in this test the use of both 60% and 50% alcohol prevented the development of streptococcal colonies, scanty lemon-yellow colonies appeared on the area treated with 60% alcohol and growth of the contaminant was abundant on that treated with 50% alcohol.

In general it would appear (though this was not apparent in experiments using Method 4) that streptococci are killed by somewhat weaker alcohol than is necessary to kill staphylococci under parallel test conditions. One experiment was carried out on a local strain of *Ps. pyocyanea*: 100% to 60% were effective, 50% was not.

Method 6.—The discrepancy between the effects of spirit dilutions on dried inocula on glass (Method 1) and on inocula on the skin or on solid culture media (Methods 4 and 5) is thus considerable. The similarity between the observations recorded of the effects produced on the skin and on inoculated plates is equally striking. A final series of experiments was made to determine the effect on dry contaminated glass slides of drops applied in the manner previously used for inoculated solid media. The test thus resembled that on media in that the exposure to the reagent was determined by the time taken for the spirit to evaporate (rather than any fixed time interval), but differed in that the reduction of the alcohol ratio by absorption of moisture is avoided. Two experiments with *Str. pyogenes* and one each with *Staph. pyogenes* and *Ps. pyocyanea* were made. The two tests on streptococcus showed an effective strength down to 50%, with a limited effect produced by 40%. The experiment with staphylococcus showed an effective strength down to 60%: 50% was only slightly less effective; 40% also produced a limited effect. The experiment with *Ps. pyocyanea* showed that 50% alcohol was effective; lower dilutions were not tested on this species.

The results therefore are more comparable with those found by Methods 1–3 than those following the use of Methods 4 and 5, *except that absolute alcohol appears to be effective when used as in Method 6.* This may be due to absorption of enough moisture from the damp air, contact with which is unavoidable in experiments carried out by this method, and hence absorption of moisture may not, in fact, be entirely eliminated.

Ether

In this series of tests Methods 3 (modified), 4, and 5 were used.

Ether Added to a Fluid Culture.—Single experiments on *Staph. pyogenes, Str. pyogenes,* and *Bact. typhosum* were made. Ether was added to broth cultures of staphylococci and *Bact. typhosum*. The cultures were shaken up with the ether, and one drop from a Dreyer's pipette was delivered on to a plate. The cultures were then left for approximately 5 minutes, re-mixed with ether by drawing up into the pipette and expelling again a few times, and again plated. Finally this was repeated after leaving the cultures for a further 15 minutes approximately. Control cultures before the addition of ether showed that both cultures produced a confluent growth on a plate, on the area where one drop from a Dreyer's pipette had spread. The results after treatment with ether were as follows:—*Staph. pyogenes:* First subculture after shaking with ether gave *confluent growth*. Subcultures after approximately 5 minutes gave an average of 14 colonies; there was no growth from the last subculture (approximately 20 minutes after first mixing with ether). There was no growth from *any* of the three subcultures of *Bact. typhosum*. A similar test with two local strains of *Str. pyogenes* showed no growth from subcultures carried out at once and after 5 minutes.

Method 4.—One experiment on *Staph. pyogenes* and one on *Str. pyogenes* were carried out. Ether was quite ineffective in destroying either staphylococcus or streptococcus on the skin.

Method 5.—The method was slightly modified by using increasing numbers of drops on a single spot on inoculated plates to observe if any poor result following single drops could be attributed to the very high rate of evaporation. Tests were made on cultures of *Staph. pyogenes, Str. pyogenes,* and *Bact. typhosum,* with the following results:—*Staphylococcus and streptococcus:* Drops of ether from 1 to 8 produced only a slight progressive thinning of growth in the area on which they fell. In an experiment on *Str. pyogenes* (Milne) accidental contamination again afforded interesting information. On this occasion a Gram-positive bacillus contained in the inoculum was absent from all areas where ether had fallen—though present on the surrounding inoculated area—in tests made with 1, 3, 6, and 8 drops of ether. *Bact. typhosum:* No growth of this organism occurred over areas covered by single or multiple drops of ether on an inoculated area on a plate.

Summary and Conclusions

Some 30 experiments, using six different methods, were carried out to test the effect of various dilutions of ethyl alcohol

on bacteria, with special reference to the optimal dilution for use on the skin. Observations were mainly made on *Staph. pyogenes* (usually the Oxford strain) and *Str. pyogenes* (Milne strain and local strains), but two tests were performed using a strain of *Ps. pyocyanea*. Six experiments, employing three methods, were made to observe the effect of ether on bacteria.

The methods used are described, and the result of the employment of each is summarized.

The following conclusions were drawn:

1. *Effective Strength of Alcohol for Destruction of Bacteria after Short Exposure.*—(*a*) *On a dry surface*:—The effective range of strengths of alcohol for the killing of non-sporing bacteria is between 90% and 50%. 95% and above are partially ineffective, 100% being markedly so. The lower surface tension of stronger alcoholic mixtures suggests that the upper limits of this effective range may be preferable to the lower, though against this must be considered the more pronounced fixing effect of strong alcohol, which may cause the coagulation of an exudate and the consequent protection of living organisms within the coagulum so formed (Bigger *et al.*, 1940). (*b*) *On the skin*:—Since the normal skin is more or less moist the effective range of alcohol for use upon it is somewhat different. 100% is commonly effective—at least on moister skins and under tropical conditions of temperature and humidity; while under similar conditions 60% to 65% may show a certain loss of efficiency. The washing of the skin before the application of alcohol might be expected to exert a similar effect unless subsequent drying were thorough. Further, the value of a low surface tension may well be of importance in increasing spread and penetration, for skin sterilization. It is therefore considered that, as a general recommendation under all climatic conditions, *80% of alcohol by volume* is probably most suitable for skin sterilization, though this will not be more effective than any other non-persistent agent for dealing with deep-lying resident flora.

2. *Bactericidal Effect of Ether.*—Ether is quite ineffective as a sterilizing agent for the skin, since its effect is very slight on staphylococci and streptococci when applied to a surface—though it is effective against certain bacillary forms, both Gram-positive and Gram-negative.

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The report for 1944 of the St. John Ophthalmic Hospital at Jerusalem has been issued from the Chancery of the Order, St. John's Gate, London, E.C. The hospital was founded in 1883, and during the year under review Field-Marshal Viscount Gort, High Commissioner of Palestine and Transjordan, paid a visit as a compliment to the work of the Order of St. John in Palestine. All the difficulties of perpetual changes of personnel have continued. So far as the decline in the number of patients is concerned, the Warden, Dr. Norman Manson, states that it is due to the impossibility of getting nurses and ward maids. This shortage is so acute in Palestine that several hospitals are almost closed. The improvement in the military situation has not been followed by any relief on the economic front; the cost of living is at least as high now as it was when Palestine was packed with troops. The clinical work has been carried out almost entirely by two surgeons and by two British Sisters with the support of a staff nurse seconded by the Director of Medical Services. The number of new cases seen during the year was 21,776, of whom 17,700 were Moslems, 3,270 Christians, and 806 Jews. The total number of patients suffering from acute conjunctivitis was 7,507, and 850 of these were complicated by corneal ulceration, which went on to perforation in 176.

ESTIMATION OF SERUM PROTEINS

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During recent years interest has been focused on the concentration of proteins in serum, as it is possible that, besides the gross reduction that is found in cases of famine oedema, a less severe reduction of the average concentration of protein in serum may occur among a population whose protein intake is low. If such less severe reductions are to be detected, the methods of estimating serum proteins must be such as will give average results which do not deviate from the true values, or values as estimated by some standard method, by at most more than 2%. It appears that the copper sulphate method recently introduced by Phillips, van Slyke, *et al.* (1944, 1945) is accurate enough if proper precautions are taken and the correct formula is used in calculating the protein concentration from the observed specific gravity.

Chibnall, Rees, and Williams (1943) have pointed out that considerable laxity has crept into the technique of estimation of nitrogen by the Kjeldahl method; their main criticism was that the times allowed for digestion of the proteins were not sufficient to ensure the conversion of all the nitrogen to ammonia. Our attention in this matter was aroused when we tried the copper sulphate method of measuring specific gravity. The relation between the specific gravity found (S) and number of grammes in 100 ml. of serum (P) is expressed by Equation 1:

$$P = K\ (S - A),$$

where K and A are constants. Moore and van Slyke (1930) found that concentrations of protein in serum of patients suffering from nephritis could be calculated from the specific gravity found by weighing. The appropriate values for K and A in Equation 1 for such sera were 343 and 1.007. However, the results obtained by Moore and van Slyke with 9 sera from normal persons did not fit this equation. In the first report (1944) of the copper sulphate method the values of K and A appropriate for this method were again given as 343 and 1.007. It was stated by workers in this country that concentrations found by the method, using this formula, agreed with those deduced from nitrogen estimations by the Kjeldahl method. We, however, found that if A was taken as 1.007 the value of K, when the method was used in sera from women before and shortly after delivery, was in the neighbourhood of 380; and in the later edition of their report on this method Phillips *et al.* (1945) give the value as 377 for use with normal sera, and 360 for use with pathological sera. The apparent discrepancies between the results of Kjeldahl estimations led us to reconsider the method that we were using.

Prof. Chibnall kindly had the total nitrogen of 15 sera, on which we also were working, estimated in his laboratory, using the reagents as described in the paper quoted and digesting for 17 hours. On the average, the results obtained by the method which we were then using were approximately 2% too low. We have assumed that the nitrogen found by Prof. Chibnall's technique was 100% of the true value. Table I shows the results obtained on a series of sera with different amounts of compounds of selenium and different times of digestion; in all these we used 0.2 ml. of serum, 0.17 ml. of 30% solution of copper sulphate, and 1 ml. of sulphuric acid; after 10 minutes' digestion 1 g. of sodium sulphate was added. If selenium was used as catalyst 0.1 ml. of sodium selenate solution (0.85 g. per 100 ml.) or an equivalent amount of selenium dioxide was added after cooling. The results are given in Table I.

To test the method most commonly used in clinical laboratories, 10 sera were digested with sulphuric acid and copper sulphate, but only 0.3 to 0.5 g. of sodium sulphate, until straw yellow; 2 or 3 drops of hydrogen peroxide were then added and the mixture boiled for a further 3 minutes. This method

returned 95.5% of the total. Even if the hydrogen peroxide was omitted the return was just under 95%.

As a routine we have digested with selenium dioxide for 3½ hours; in view of the above we can assume that the protein

TABLE I.—*Percentage of Nitrogen recovered in Kjeldahl Estimation (the amount obtained by 17 hours' digestion with selenate is taken as 100%)*

No. of Sera	Extra Catalyst Added	Time of Digestion	% Recovered
12	Selenium dioxide	3½ hrs.	99
21	Sodium selenate	50 mins.	99
17	Selenium dioxide	50 mins.	98·5
15	None	3½ hrs.	98
10	H_2O_2	3 mins.	95·5

concentrations calculated from our Kjeldahl nitrogens are certainly not too high, and probably on the average are about 1% too low. If A in Equation 1 is assumed to be 1.007 the value of K that fits our results is 384—giving Equation 2:

$$P = 384\ (S - 1.007).$$

However, we found that the specific gravities of the drops formed in copper sulphate solutions by the method described by Phillips *et al.* are less than those obtained by weighing in a pyknometer; while, if the drops are formed in the copper sulphate solution instead of being allowed to fall into it from above, the resulting specific gravity is approximately the same as that found by weighing. It is possible that this change in specific gravity is due to air that is entrapped during the fall. The value 1.007 for A was chosen because this is the specific gravity of protein-free ultrafiltrate from serum. If the difference in the specific gravities of drops formed inside and outside the copper sulphate solution is due to this entrapped air and not to a change in the serum protein it is reasonable to change the value of A and to retain a value of K which is appropriate for true specific gravities. We have found that Equation 3,

$$P = 366\ (S - 1.007),$$

fits our results obtained by weighing in a pyknometer. If this value of K is used the value of A obtained for normal sera is 1.0061. For convenience of calculation we propose Equation 4,

$$P = 364\ (S - 1.006).$$

The difference in the calculated results introduced by this change in K and A is negligible. A variety of equations, with different values of K and A, can be propounded that will fit the values of the apparent specific gravity as found in the copper sulphate method and of protein concentration found in normal sera, all containing between 6.5 and 7.8 g. of protein per 100 ml. To determine the two constants we need sera containing less or more protein. The obvious sera to use would be those of patients with nephritis and oedema. However, the figure given by Moore and van Slyke (1930) suggests that the constants suitable for such cases differ from those suitable for normal sera. As this method will probably be used to estimate proteins in sera of persons suffering from malnutrition, a form of the equation suitable for such sera will be appropriate. In the 6 sera with the lowest serum proteins obtained from returned prisoners of war we arrived at the results shown in Table II.

TABLE II.—*Protein Concentration in Sera of Returned Prisoners of War, calculated from the Specific Gravity by Equations 4 and 2 and from the Nitrogen, calculated by Kjeldahl's Method*

Case	Kjeldahl	Equation 4	Equation 2
3	6·14	6·08	6·03
15	5·27	5·17	5·07
11	5·97	5·93	5·88
18	5·51	5·39	5·30
5	5·88	6·01	5·95
16	6·02	6·19	6·14

In 4 out of the 6 the concentrations calculated by Equation 4 agree better with the Kjeldahl results than those calculated by Equation 2.

With 101 sera from "normals" (blood donors, laboratory technicians, and students), normal pregnant women, normal women after delivery, and returned prisoners of war, all of whom had lost much in body weight, we obtained the results shown in Table III.

TABLE III.—*Differences between Protein Concentration calculated from the Specific Gravity by Equation 4 and from Nitrogen Estimation*

Per cent.	Normals	Returned Prisoners of War	Ante-natal	Post-natal
+ 5·0 to + 5·9	0	0	0	1
+ 4·0 to + 4·9	1	0	0	2
+ 3·0 to + 3·9	0	2	1	6
+ 2·0 to + 2·9	0	5	1	4
+ 1·0 to + 1·9	3	2	4	3
− 0·9 to + 0·9	10	7	11	12
− 1·0 to − 1·9	4	2	5	2
− 2·0 to − 2·9	1	5	5	0
− 3·0 to − 3·9	1	1	4	1
− 4·0 to − 4·9	0	1	0	0
− 5·0 to − 5·9	0	0	1	0
Total number	20	25	32	31
Mean difference %	−0·2	−0·1	−1·0	+1·4
K calculated statistically	354	359	327	345
A " "	1·0054	1·0057	1·0037	1·0052
K calculated for A = 1·006	365	364	368	359

It should be noted that Equation 4 is based primarily on the assumption with regard to the value of A. Statistical calculation of the equation that fitted the results would give lower values for A in Equation 1.

Phillips *et al.* (1945) in their second description of the method state that the equation suitable for pathological sera for A in Equation 1.

$$P = 360\ (S - 1.007).$$

We have, however, found that Equations 2 and 4 fit the pathological sera that we have examined. Phillips *et al.* also recommend that Equation 5 should be used generally for all sera. But this would result in a discrepancy of about 6% between estimations made by this method and those based on accurate estimations of the protein nitrogen.

Specific gravity methods have been criticized in the past because they have given results that disagreed with those derived from Kjeldahl estimations. It appears, however, that some of the Kjeldahl methods in use are liable to errors of at least 10%; the grosser discrepancies may be due to faults in the Kjeldahl methods used. The copper sulphate method is extremely simple and convenient. If a stock solution accurately made up or even a series of standard solutions were issued from a centre, gross discrepancies between the results of estimations of serum proteins would be avoided.

The drops should be allowed to fall into the fluid, as described by Phillips *et al.*; if formed in the fluid, a separate dropping pipette must be used for each drop and much of the convenience of the method is lost. In an established laboratory a gradient method as described by Jacobsen and Linderström-Lang (1940–1) may be quicker and more convenient; we propose to publish a paper on this method shortly. Both these methods have the advantage over other specific gravity methods that changes of temperature have little effect.

The specific gravity which we have considered is the ratio of the weight of a given volume of serum to the weight of an equal volume of water, both at 24° C. The difference in the specific gravity observed, if the measurement is made at a different temperature, is only about 0.00001 per degree, as the coefficient of expansion of serum differs little from those of the copper sulphate solutions. If, therefore, the specific gravity is measured at a temperature as low as 14° or as high as 34°, instead of 24°, the error in the calculated concentration of protein would amount to only about 0.04 g. per 100 ml.

As Phillips *et al.* point out, it is essential that, in preparing the standard solutions, the stock solution and water used for dilution should be at the same temperature. If this precaution is observed the specific gravities of a standard solution at 24° (that is, the ratio of the weight of a given volume of solution at 24° to that of the same volume of water also at 24°) will not vary by more than ±0.0001 if the dilution is done at any temperature between 10° and 40°. The stock solution should be prepared at 24°; but an error of not more than ±0.0001 in the specific gravities of the standards will be introduced if the solution is made up at any temperature between 14° and 34°. The volume of the drop of serum should be about 0.02 ml. The

height from which it falls should be such that it forms a ring when it enters the fluid. If cups or umbrellas are formed the apparent specific gravities will be higher; if the pipette is not steady fluffy rings will be formed and the apparent specific gravity found will be less.

Summary

The copper sulphate method for measuring specific gravity of serum gives satisfactory and consistent estimates of the protein concentration.

The apparent specific gravities found by this method are less than the true specific gravity.

The equation recommended for calculating the protein concentration from the apparent specific gravity is $P = 364 (S - 1.006)$.

For satisfactory and consistent measurements of serum protein by the Kjeldahl method, selenium dioxide should be used as a catalyst and digestion should be continued for at least one hour, and preferably for 3½ hours.

We wish to express our thanks to Prof. Chibnall for his advice and assistance.

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FOUR CASES OF TYPHUS FEVER IN GREAT BRITAIN

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Typhus fever is rare in Great Britain. From a review of the recent literature on its incidence it would appear that only one case occurring in 1944 has been recorded (Agnew and Kyles, 1944). As several cases of typhus fever are now under treatment in this country, it may prove of interest to report a small series of four patients who developed this disease while in hospital in Bradford. Three of these cases had been under constant medical supervision before the development of the disease, and it has thus been possible to follow the course of their illness from the day of onset.

The four patients referred to in the following report had been released from the same prisoner-of-war camp in Germany, in which, so far as can be ascertained, typhus fever was endemic. They were all disinfested by the routine procedure of insufflation of their clothing by dichlor-diphenyltrichlorethane (D.D.T.) powder on April 26, 1945. They arrived in England two days later and were immediately transferred to hospital, where on admission they were found to be free from lice.

Case I

A man aged 25. His general condition on admission was fairly satisfactory, his weight then being about 14 lb. below his normal. On May 3—i.e., seven days after disinfestation—there was an unexplained rise of temperature to 102° F., with a pulse rate of 124. Prodromal symptoms were entirely absent, apart from a feeling of "fatigue," which persisted throughout the illness. The pyrexia and tachycardia continued for 10 days and then fell by slow lysis over a period of four days. The total duration of the febrile period was 13 days, and while during this time the patient developed a fairly well marked degree of toxaemia, this at no time gave rise to any anxiety. His mental condition remained fairly normal throughout the illness, and although towards the end of the first and beginning of the second week there was definite mental confusion, there was neither violent delirium nor restlessness. Conjunctival suffusion was present at the start of his illness. The rash, which was reported to be macular in character, developed on the fourth day and showed the typical distribution over the trunk and limbs only. When seen by one of us eight days later it had entirely disappeared. There was no splenomegaly. On the 14th day of the disease there was clinical evidence of meningism, but lumbar puncture revealed a normal cerebrospinal fluid. The following pathological investigations were made:

5th day of disease:
Widal reaction = Positive agglutination to 1 : 50 against *B. typhosus*
12th day of disease:
Weil-Felix reaction: agglutination against OX 19 to 1 : 250
14th day of disease:
Weil-Felix reaction: agglutination against OX 19 to 1 : 1000

The patient made an uninterrupted recovery.

Case II

A man aged 44. The general condition of this patient remained satisfactory until May 5—i.e., 9 days after disinfestation—when there was a rise in his temperature and pulse rate to 99° F. and 100 respectively. The next day his temperature had risen to 104° F. At this time the patient had a septic right thumb, which required incision and drainage. From this, the 4th day of his illness, his general condition deteriorated steadily, so that by the 10th day the typhoid state was well established. There was a low muttering delirium, and signs of cardiovascular failure soon became apparent. When seen by one of us on the 12th day he was *in extremis*, and died within 24 hours. On the 6th day a subcuticular mottling appeared over the trunk, together with a petechial rash, which was profuse on both trunk and limbs. On the 10th day the spleen was reported to be slightly enlarged. Conjunctival injection was marked.

Pathological reports included the following relevant findings:—On the 11th day of disease: White blood count, 16,000 per c.mm.—polymorphs, 64%; lymphocytes, 28%; Türck cells, 2%; mononuclear leucocytes, 6%; blood urea, 86 mg. per 100 c.cm. Urine: Albumin ++; a few granular and epithelial casts present. Weil-Felix reaction: Agglutination against OX 19 to 1: 10,000; against OX 2 to 1: 50.

At the necropsy all the organs showed evidence of passive congestion. The spleen was normal in size, with soft diffluent pulp. There was a diffuse rash over the body, merging with post-mortem lividity. Discrete small macules were present on the trunk, and were profuse on the legs and inner aspects of the arms. A few petechial haemorrhages were also present.

Report on the skin section: In the skin macule the small vessels showed marked congestion, with collections of inflammatory cells (mainly lymphocytes) in and around the adventitia.

Case III

A man aged 25. This patient was discharged home on leave four days after his arrival in England and was readmitted to hospital 12 days later. He stated that for the preceding six days he had been suffering from vomiting and diarrhoea with severe headache and backache, the illness beginning with a shivering attack. The illness commenced 11 days after disinfestation, assuming that the onset dated from this shivering attack. On admission his temperature was 100.6° F. and pulse rate 94. The pyrexia which followed was of an irregular character and reached 104.8° F. on the 9th day of the illness, and there was a tachycardia of 150 on the 11th day. The febrile period continued for 13 days and then fell by slow lysis over 4 days. The rash appeared on the 9th day, and consisted of petechiae, mainly present on the abdomen and legs, but this distribution soon involved the whole trunk and limbs. At this time there was a very well marked conjunctival suffusion. An enlarged spleen was easily palpated and was found to extend two fingerbreadths below the left costal margin. During his illness there was a mild toxaemia, accompanied by lethargy and a fine tremor of hands and feet. There was also some mental confusion, most marked at night, but no undue restlessness.

The pathological findings were:—On the 9th day of disease: Blood urea, 90 mg. per 100 c.cm. Urine: Hyaline and occasional granular casts present. Weil-Felix reaction: Agglutination against OX 19 to 1: 250. On the 16th day of disease the Weil-Felix reaction showed agglutination against OX 19 to 1: 1000. The patient had a rapid convalescence.

Case IV

A man aged 29. He was a contact of Case I, being a patient on the opposite side of the ward, but as he was ambulant during the early part of the latter's illness a closer contact may have occurred. On the 27th day after disinfestation the patient complained of nausea, fairly severe frontal and occipital headache, and malaise. His temperature and pulse rate in 12 hours rose from normal to 103.2° F. and 96. This rise was followed by a short febrile period of only 5 days, when the temperature was of an irregular character, as in the other three cases. Apart from a mild conjunctival injection, there were no other clinical signs during this man's illness.

Pathological Report.—2nd day of disease: Weil-Felix reaction—positive agglutination against OX 19 to 1: 50 and against OX K to 1: 25; 6th day of disease: Positive against OX 19 to 1: 1000. The patient's general condition remained excellent throughout, and his symptoms rapidly disappeared when his temperature had subsided.

Commentary

Case II suffered from a severe attack of typhus fever, the diagnosis of which appears obvious in retrospect but was rendered difficult at the time by the presence of the septic thumb, which dominated the clinical picture. The continued pyrexia was originally attributed to a septicaemia secondary to the septic focus together with a possible concomitant attack of malaria. That death occurred in this man, who was 44 years of age, confirms the recognized fact that the mortality rate from typhus fever increases with the age of the patient (Mackenzie, 1941).

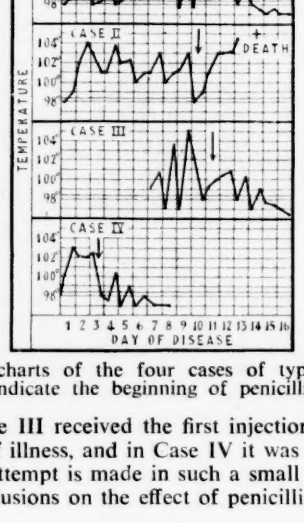
Cases I and III had fairly mild but typical attacks of typhus fever, although at no period of their illness was the toxaemia profound. These cases also differ from the classical description of typhus fever in that delirium was not pronounced and certainly was not of the dissociation or occupational type.

Case IV presents several interesting features: (*a*) The first sign of the disease developed 27 days after thorough disinfestation —i.e., 4 days longer than the recognized limit of the incubation period for this disease (Memo. on Louse-borne Typhus Fever, No. 252, 1941). As already stated, this patient was a fairly close contact of Case I throughout his illness. That Case IV was a secondary infection from Case I is the obvious explanation, but no other secondary cases have occurred either among other patients in the same ward or among the nursing or medical staff. There have been no secondary cases from Cases II and III, which were nursed in different wards from Case I. (*b*) The attack of typhus fever was of the abortive type, in that the total duration of the illness was only 5 days and in that the classical signs of the disease did not develop as in the other cases. Positive Weil-Felix reactions also occur in undulant fever in titres of 1 in 50 to 1 in 240, but the progressive rise in titre does not (Findlay, 1941). The Weil-Felix reaction in this patient showed a diagnostic rise in titre from 1 in 50 on the 2nd day of the illness to 1 in 1,000 four days later. (*c*) The early appearance of the positive Weil-Felix reaction on the 2nd day of the illness is uncommon (Felix, 1941). The patient was questioned as to the possibility of previous immunization against typhus fever. The last prophylactic injections he received were in July, 1942, but he is ignorant of their character, and it is impossible to determine this most important point. In the light of this case it is clearly of diagnostic importance to perform a serological examination at the earliest opportunity in any patient suspected of typhus fever. It is recognized that a titre of 1 in 80 to 1 in 100 is necessary before a clinical diagnosis can be confirmed.

Rash.—The typical exanthem occurred in three of these patients and appeared on the 4th, 6th, and 9th days of their illness. It showed the typical distribution of that of typhus fever in that, while absent on the face, it was profuse on the body and limbs, particularly in Cases II and III. The rash was definitely petechial in character, the size of each petechia varying between 1 and 2 mm. in diameter. The colour, originally a bright pink, changed to a dark bluish-red. It did not appear in crops, and persisted distinctly for 3 days in Case III before fading, when it was replaced by a brownish staining which gradually disappeared. The subcuticular mottling described in this disease was widespread on the trunk and limbs in Cases II and III, but this element of the rash faded more quickly than did the petechiae in Case III. Accompanying the rash there was conjunctival suffusion, which was well marked in the first three cases.

Type of Pyrexia.—As can be seen from reference to the accompanying temperature charts, the type of pyrexia is similar in all four cases. The temperature shows a well-marked intermittent and remittent character—a feature which is even more pronounced in the four-hourly charts. Disproportionate bradycardia, as is said to occur in some cases of typhus fever, was not observed in this small series of cases.

Penicillin Therapy.—Penicillin was administered to these patients for prophylaxis against the possible development of the secondary infections which are likely to occur during the course of this disease. Such conditions as bronchopneumonia, septic parotitis, and septic conditions of the skin have been common in the epidemics of typhus fever in Europe (Megaw, 1942). Penicillin was given by three-hourly intramuscular injections of 15,000 units to all four patients, but, as can be seen from the temperature charts, it was begun at different stages in these cases. In Case I penicillin therapy was started on the 13th day of the disease, when the temperature and pulse rate were already falling by lysis. In Case II the first dose of penicillin was given about 72 hours before death, when the patient was profoundly



Temperature charts of the four cases of typhus fever. The arrows indicate the beginning of penicillin therapy.

toxaemic. Case III received the first injection of penicillin on the 11th day of illness, and in Case IV it was first given on the 2nd day. No attempt is made in such a small series of cases to draw any conclusions on the effect of penicillin on this disease.

Summary

Four cases of typhus fever imported into England by repatriated prisoners of war are described and the important clinical features of each case are briefly reviewed. One patient died, and a note on the post-mortem examination is included. Another of these patients had an abortive attack, the interesting features of which are described in some detail.

We wish to thank Drs. Weiner and Yang for the use of their clinical notes, and Drs. Kellett and Gartside for the various pathological examinations and reports.

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SORE FINGER-TIPS IN INDUSTRY

PROTECTION BY HYDROGEN PEROXIDE

BY

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This is a record of an accidental discovery of a promising method for preventing injury to the skin of the finger-tips by constant friction against a rough surface.

Medway Paper Sacks Ltd., an associated company of Albert E. Reed and Co., paper makers, Aylesford, Kent, is engaged in making large sacks from strong brown paper (kraft). This paper has a rough surface, and the sacks are finished by passing either one end or both ends through a wire-stitching machine. The paper passes through this machine with a rapid jerky motion, and is guided by the operator's fingers. During the whole of an eight-hour day her fingers are rubbing over the rough dry surface of the paper. This amount of friction causes damage to the skin of the finger-tips, and until recently two-thirds of the women working on the stitching machines visited the surgery about once a fortnight for treatment. The remaining one-third were unaffected, although many of them had been on the same work for years. The reason for this has not been discovered; there is no difference in the method of handling the paper.

Treatment consisted in applying half-inch zinc oxide plaster so as to cover the finger-tip completely. This relieved the pain, and enabled the work to be continued. The adhesive plaster was kept on day and night, and was renewed every few days until the finger had healed. There is no evidence to show that this treatment slowed up production, but time was wasted in surgery attendances, and a good deal of discomfort was suffered. The lesion produced by so much friction on the finger-tips is shown in the photograph reproduced here.

Photograph of the right hand of Mrs. N. G.

The striking feature about the affected finger-tips was the absence of the horny layer of the skin. This is not well shown in the photograph, but the drops of blood exuding from the tips of the middle and ring fingers can be clearly seen. These two fingers were the ones usually most severely affected. The thumb nearly always escaped. There was often a general hypertrophy of the skin of the finger-tips, producing a bulbous appearance, which is seen in the photograph on the ring and little fingers.

Various measures had been tried to prevent this trouble. Industrial rubber gloves were useless, as the worker lost her sense of touch. Thick rubber finger-stalls were unsatisfactory for the same reason, and output was slowed up. Thin rubber finger-stalls wore out in a few hours. Trials were made of a hard-setting rubber solution painted on the finger-tips before starting work. This was satisfactory, but was discarded because the solution had to be reapplied every two or three hours.

Method

At this stage one of the workers volunteered the information that three weeks previously she had accidentally splashed a finger with 20-vol. hydrogen peroxide while dressing her child's hand. She noticed during the next few days on the machine that this finger-tip did not get sore like the others. She therefore tried applying peroxide to all her finger-tips. For the first week she did this at night and during the dinner hour. Her fingers were so much better that during the second week she applied the peroxide at night only. The number of applications was still further reduced to three or four during the third week. To her surprise she had had no sore finger-tips since using peroxide. For four years she had been working on stitching machines, and had often attended the surgery for treatment.

It was clear that this remedy was worth investigating. Six of the worst sufferers volunteered for a trial, and the result was so promising that arrangements were made to issue peroxide to all the workers (21 in number) who had been troubled with sore finger-tips. These 21 women were given 1-oz. wide-neck bottles three parts filled with 20-vol. hydrogen peroxide. These bottles had a bakelite screw cap and were labelled with the worker's name and clock number, and the date of issue. The women kept them in their handbags. Instructions were given to dip each finger-tip into the peroxide and to wave the hands in the air till the liquid dried. This was to be done three times a day—at night, on starting work in the morning, and during the dinner hour. Within a few weeks it was quite clear that this routine was producing a notable improvement in the fingers of all the women. By subsequent inspection it was found that in many cases the fingers could be fully protected by reducing the number of applications to three or four weekly.

The effect of the treatment is indicated in the table below, which compares over two periods of six months the surgery attendances of 12 of the 21 women who had been working under identical conditions both before and after treatment. No comparison has been made in the attendances of the remainder, whose work during the two periods is not exactly comparable. They had been doing other work at intervals, had been working with different sorts of paper, or had left during the period of the test.

Table showing Surgery Attendances for 12 Workers for the Treatment of Sore Finger-tips

Worker's Initials	Number of Visits to Surgery	
	During Six Months Before Using Peroxide	During Six Months After Using Peroxide
E. D.	17	2
C. F. *	34	2
K. B.	24	5
B. T.	12	1
O. J.	19	3
G. T.	10	1
V. K.	11	2
E. H.	9	1
J. H.	14	1
K. B.	14	0
N. G.*	24	3
R. C.	4	0
Total visits ..	192	21

* See illustration.

Commentary

It is realized that this is by no means an ideal control, but an adequate control series would have required some interruption of the treatment after it had been begun, and the benefit to the workers was so clear that this course seemed unjustified. There is, however, no reason to suggest that the two periods are not comparable: the output per worker was approximately the same, the amount of absenteeism from all causes in the group was actually greater in the six months prior to the introduction of the peroxide (233 as against 147 days lost), and "surgery attendance" indicates a lesion of about equivalent severity in each period. The women themselves are in no doubt that the treatment has been beneficial, and it has been simple to administer. Their bottles of peroxide require filling every four to six weeks, and they come regularly to the surgery for this purpose.

In order to determine the deterioration in the strength of the peroxide after five weeks' use, analyses were carried out in the chemical laboratory of Albert E. Reed and Co. The stock bottle of 20-vol. H_2O_2 was found to contain 20.4 volumes of hydrogen peroxide. Samples were taken from the 1-oz. bottles of six workers at random after they had been in use about five weeks. These samples were analysed, and they showed practically no deterioration. The weakest was 19.5-vol. H_2O_2. This test was done in hot weather, and of course the stoppers of the bottles were frequently removed by the users.

Efforts have been made to find out exactly why peroxide should prevent sore finger-tips, but without success. Peroxide in this strength produces some coagulation the surface proteins in the skin, which appears usually as a number of small white pin-points. There is no reason to assume that there is any particular chemical substance in the paper against which peroxide is giving protection, and its action is presumably due to the effect of coagulation on increasing the resistance of the skin to friction. No ill effects have been caused by the use of 20-vol. hydrogen peroxide in the way described above.

Summary

An accidental observation by a wire-stitching machine operator in a paper-bag factory has led to the discovery of a method which largely protects the skin of the finger-tips from damage by the constant friction in this work. The operator is supplied with a small quantity of 20-vol. hydrogen peroxide, into which each finger is dipped. The necessary number of applications varies from three times a week to four times a day. All the workers have noted the considerable protection which this treatment affords. In a group of 12 women working under strictly comparable conditions for a

period of six months before and after treatment, the number of attendances at the surgery for the treatment of sore and bleeding finger-tips fell from 192 to 21. The result of this small series would appear to make further trials on a larger scale worth while.

My thanks are due to the management and staff of the Aylesford Paper Mills and Medway Paper Sacks Ltd. for their help in carrying out this investigation, and for their permission to publish this paper

A THERAPEUTIC TRIAL OF CHOLINE CHLORIDE IN INFECTIVE HEPATITIS

BY

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Choline is a powerful lipotropic agent (Best and Huntsman, 1932), and in experimental animals has been shown to have the effect of reducing the cirrhosis which follows the infiltration of the liver with fat after taking a high-fat diet (Daft, Sebrell, and Lillie, 1942 ; György and Goldblatt, 1942). It is considered to exert its lipotropic effect by promotion of lecithin (phospholipid) synthesis in the liver, as phospholipids are actively concerned with the transport of fat and cell structure.

The action of choline in preventing cirrhosis is different when methods other than dietetic are used for the production of fatty livers (McHenry and Patterson, 1944). It has no effect in preventing the accumulation of cholesterol esters in "cholesterol" fatty livers, and while in curative experiments it causes a rapid decrease in glycerides, the reduction of cholesterol esters is slow. The fatty liver produced by the ketogenic fraction of the anterior pituitary is not prevented by choline, and large doses are required to prevent damage in carbon tetrachloride poisoning or to increase the disappearance of fat from the liver in the recovery period of phosphorus poisoning.

Himsworth and Glynn (1944) have distinguished two distinct types of liver injury due to diet. One follows long-continued fatty infiltration of the liver due either to excessive intake of fat or to deficiency of lipotropic factors such as choline, and the second results from lack of amino-acids in sufficient amounts in the diet. The injury resulting from the amino-acid deficiency is characterized by necrosis, and against this choline has no beneficial effect—in fact, Himsworth and Glynn suggest that it tends to aggravate the hepatic necrosis by reducing the high fat content of the liver. It will be seen, therefore, that though choline prevents fatty infiltration and the consequent cirrhosis that results from the intake of an excessive amount of fat, there are various experimental conditions in which it is unlikely to have a beneficial effect on the liver.

The work that is recorded here was started at about the same time as Higgins and his associates began their investigations into the therapeutic effect of methionine in infective hepatitis at Oxford (Higgins *et al.*, 1945). There was, however, a distinct difference in the circumstances under which the trials were undertaken, as 21 of our cases were patients in a general hospital over-seas, and thus it was not possible to carry out the detailed biochemical study to which reference is made in their paper.

The Trial

No attempt was made to select cases so as to get those of comparable severity, but alternate patients were given choline chloride 1.5 g. a day for the first eight days following admission. All the patients were serving soldiers between 20 and 50 years of age, and their diets were similar except for the plentiful supply of fresh fruit for drinks that was available for those treated in Algeria. Both the treated and the control series received vitamins A and D (and K in 21 cases) as an addition to a low-fat high-carbohydrate diet. The amount of protein in the diet was left largely to the patient's preference, and under the conditions of the experiment it was not possible to determine the quantities each patient consumed.

Considerable care was taken to exclude liver disease from other cause and the presence of any intercurrent infection—a very important precaution in a hot climate. Special attention was paid to the possibility of men having received an organic arsenical for any reason, and no case in which there was any doubt was included. The patients were treated in bed. The decision as to when they should get up was recorded, as well as the length of stay in hospital, as a substantial reduction in either would be a very practical way of demonstrating therapeutic efficiency. The day on which their appetite returned was noted for a similar reason, but the date of disappearance of jaundice was not, as discoloration of the conjunctivae persisted in several cases after the patient was considered fit to leave hospital. The only biochemical investigations that were undertaken were repeated estimations of the serum bilirubin and examination of the urine for the presence of bile pigments.

Results

The level of the serum bilirubin was estimated on admission. This, coupled with the number of cases that had a rising serum bilirubin while under observation, was used as a means of assessing the comparability of the treated and control series. The number of days of malaise and the length of icteric period before admission are shown for a similar reason in Table I.

TABLE I

	Subjects	
	Treated 16	Control 16
Duration of illness before admission, in days ..	8·3 (3–29)	8·1 (2–21)
Icteric period before admission, in days ..	1·4 (1–5)	1·7 (1–7)
Serum bilirubin on admission (mg./100 c.cm.)	4·7 (1·0–12·2)	6 1 (1·25–14)
Number of cases with rising serum bilirubin ..	5	6

The average number of days and the levels of serum bilirubin in milligrammes re shown—the variations are in brackets.

In such a small series, when much larger numbers would be required to be statistically significant, the importance of finding means of showing that the cases were of comparable severity is obvious. It is thought that Table I shows this to be so, although it will be noted that the level of the serum bilirubin on admission was lower in the treated than in the control cases.

The results of giving choline chloride can be seen in Table II, and it may be mentioned here that they were closely similar in cases treated at home and those treated over-seas.

TABLE II

	Subjects	
	Treated 16	Control 16
Maximum serum bilirubin (mg./100 c.cm.) ..	6·0 (1·5–15)	7·9 (2·0–14·0)
First day of fall of bilirubin to 0·6 mg./100 c.cm.	25·1 (11–50)	30·1 (10–55)
First day urine bile-free	20 (10–29)	22·2 (10–42)
First day of return of appetite	15 (2–33)	14·4 (0–33)
First day allowed up	39 (13–54)	28·8 (13–46)
Duration of stay in hospital	35 (13–79)	40·7 (27–56)
Number of relapses known	4	5

Discussion

We were fortunate in getting our cases early on, in the period of the disease that was accompanied by jaundice. The average number of days that the urine was dark before admission to hospital was 1.4 in our cases, compared with 4.4 in the methionine-treated cases reported by Wilson, Pollock, and Harris (1945). The dose of choline chloride that we gave—1.5 g. daily—is approximately one-third of that of methionine used by the Oxford and Cambridge workers. This gives comparable dosage as regards methyl equivalents, and is probably adequate.

The figures shown in Table II for the first day on which the serum bilirubin fell to 0.6 mg. per 100 c.cm. and for the duration of stay in hospital are a little lower for the treated than for the untreated cases. It is thought, however, that these results, as a whole, must be taken to show that choline chloride, under the conditions of the experiment, had no therapeutic value.

Summary

Alternate cases of infective hepatitis were given 1.5 g. of choline chloride as a supplement to a low-fat high-carbohydrate diet with the addition of vitamins. Sixteen cases were so treated, and no significant benefit over 16 control cases was noted.

Our thanks are due to Prof. L. J. Witts for suggesting the work and sending us the choline chloride, and for his generous advice and help. We also wish to thank Col. W. H. O'Riordan, *M.C.*, for permission to forward this paper for publication.

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Medical Memoranda

Palindromic Rheumatism

This syndrome was described by Hench and Rosenberg (1941) on the basis of their findings in 34 cases; of these 19 were males and 15 females. They recorded multiple afebrile attacks of acute arthritis, peri-arthritis, and sometimes also para-arthritis with pain, swelling, redness, and disability. The attacks appeared suddenly, developed rapidly, and lasted for a few hours up to about 24, and recurred at short or long irregularly spaced intervals. The blood sedimentation rate was normal between attacks, but rose to an average of 24 on the uncorrected Westergren scale. The history in these patients extended over periods varying from 1 to 25 years, with from 2 up to 250 attacks a year. The attacks lasted from 3 hours to 6 days, and successive attacks affected different joints. The authors recognized the similarity to the angio-neural arthrosis described by Solis-Cohen (1911, 1913, 1914) and to the allergic arthritis described by Kahlmeter (1939), but the syndromes reported by the latter authors show certain fundamental differences from that of Hench and Rosenberg. Intermittent hydrarthrosis, excellently described by Garrod (1907), also differs from palindromic rheumatism in that the attacks generally recur in the same joint and at mathematically regular intervals. Cain (1944) recorded a single case apparently conforming exactly to the picture of palindromic rheumatism. No other case reports appear to have been published.

The following case seems to conform to the typical description:

A Port official was admitted to the Seamen's Hospital on Sept. 1, 1943. He gave a history of flitting pains in the joints, first noticed in 1930 after he had fallen into the river. The joints became painful and repeatedly swollen, and the disability lasted from 1 to 2 days at the most. There was great variability in both the type and the situation of the pain and also in its duration, but almost every joint in the body had at one time or another been affected. He had no constant symptoms except excessive perspiration. On examination tachycardia was present, but there was no other evidence of systemic disease. Temperature was normal throughout his stay in hospital. On the second day after admission he had swelling of the right knee-joint with erythema and tenderness. On the following day the left ankle-joint was affected. At subsequent periods during a six-weeks stay in hospital almost every joint in the body was involved. Blood sedimentation tests gave the following readings at approximately weekly intervals: 75/200, 43/200, 47/200, 51/200, 82/200, 30/200, and 23/200. A careful search revealed no focal sepsis. Radiographs of the chest were within normal limits. Electrocardiograms and the urine were normal. The Wassermann reaction, Kahn test, and gonococcal C.F.T. were negative. The white blood count was 9,000 per c.mm. (polymorphs 52%, eosinophils 1%, large mononuclears 3%, large lymphocytes 2%, small lymphocytes 42%). The blood serum did not agglutinate *Brucella abortus*. *X*-ray examination of bones and joints showed no pathological changes.

Various lines of treatment were tried, including a prolonged course of sulphathiazole, intramuscular injections of contramine, and the salicylates. The condition showed no improvement, and during the months which succeeded his stay in hospital the attacks continued almost exactly as before.

This complete therapeutic failure conforms to the experience of the authors quoted, and when the patient was last seen in Jan., 1945, his condition was virtually unchanged.

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Reviews

NEUROLOGY, PSYCHIATRY, ENDOCRINOLOGY

The 1944 Year Book of Neurology, Psychiatry and Endocrinology. Neurology, edited by Hans H. Reese, M.D. Psychiatry, edited by Nolan D. C. Lewis, M.D. Endocrinology, edited by Elmer L. Sevringhaus, M.D. (Pp. 712; illustrated. 18s. 6d.) Chicago: The Year Book Publishers; London: H. K. Lewis and Co. 1945.

The mass of medical literature continually poured out makes the busy practitioner more and more dependent on critical summaries and reviews such as are provided by the *Year Book of Neurology, Psychiatry and Endocrinology*. The current volume maintains the standard of its predecessors. Choosing articles almost at random, we note that Dr. Denny-Brown has concluded that epilepsy is an infrequent complication of injury to the head in general, and that laceration of the brain is an essential factor, particularly if resulting in a cerebro-dural scar. Early convulsions within the first eight weeks must be distinguished from true epilepsy, which is of later onset. The electro-encephalogram naturally receives attention from various writers. Now that so much interest is taken in the scientific study of delinquency it is important to observe that the E.E.G. has not proved of value in diagnosing the criminal mentality. It is of course abnormal when the criminal has an organic disease of the brain, but the psychopath shows the same departure from normal, whether a criminal or not, while the non-psychopathic offender shows a normal rhythm. Post-mortem records bring to light a much larger number of abnormalities of endocrine glands and of new growths in paranoid than in non-paranoid psychotics. Dr. Nolan Lewis is very cautious in his assessment of the value of shock therapy. He agrees with the general experience that insulin is preferable for schizophrenics and electric shock for the manic-depressives. Psychoneurotics show questionable benefit. There is no good evidence that damage is done to the brain, and fractures and dislocations are not frequent enough to interdict the treatment in carefully selected cases. It now seems to be established that the muscular weakness of myasthenia gravis is due to a failure in the synthesis of acetylcholine. The serum of a myasthenic patient can inhibit this synthesis *in vitro* and can produce the curare phenomenon in the isolated muscle–nerve preparation from a frog. The action of thiouracil is the subject of several papers. If rats are injected with radio-active iodine the drug can be traced to the gland and the consequent inhibition by thiouracil of its synthesis into di-iodotyrosine and thyroxine observed. The production of thyroid hormone stops promptly and almost completely when thiouracil is given. Clinically it brings down the basal metabolic rate, though this response is delayed when iodine has been previously administered. These few examples will give some idea of the varied interest of the *Year Book* for 1944.

AMERICAN MEDICAL PRACTICE

American Medical Practice in the Perspectives of a Century. By Bernhard J. Stern, Ph.D. (Pp. 156. 8s. 6d.) New York: The Commonwealth Fund; London: Oxford Medical Press.

This is a preliminary statement made by a committee of the Council of the New York Academy of Medicine, instructed to review the nature, quality, and direction of the economic and social changes taking place and to be anticipated in the U.S.A., and to report what the medical profession can do about it. It included doctors, dentists, nurses, and laymen. The book is well documented and contains a valuable series of monographs designed, presumably, to serve as a basis for a later report and recommendations. The problems dealt with have a strong resemblance to those which face the medical profession everywhere. The development of medical practice in the U.S.A. and the gradual rise of the doctor in the public estimation are well told. The question of "specialism" receives much attention because it is largely responsible for the rise in the cost of medical care, and has influenced the distribution of the profession. Its growth is traced largely to the introduction of expensive diagnostic instruments needing special competence to handle. There are no fewer than 14 certifying boards for "specialism" in the United States, and in 1942 there were 49 "specialists" to every 51 general practitioners. As they require elaborate hospital facilities they are found mainly in the large and more wealthy centres of population. "Specialism

has complicated medical care in manifold ways and increased the cost tremendously." But it has had a stimulating effect on the work of the general practitioner, whose standard of efficiency is steadily rising.

The gradual decline of the family doctor is noted with regret because "the standards of general practice determine the quality of medical care which the rural and lower income groups receive." A survey in New York shows that two-thirds of the lower income group had no family doctor. There is a tendency to more and more "office" consultations in buildings in which the doctors can share the "overheads," but this is making the doctor more remote from his patients. Much attention is given to the problem of distribution of the profession. In the poorer areas where the population is increasing through high birth rates little inducement is offered for building up a practice; the young men are therefore attracted more and more to the wealthy areas. The greatly increased cost of medical education is a significant factor in deciding the distribution of doctors. It is estimated that it costs a minimum of 5,000 dollars to cover the student's career, and then there is the steadily mounting cost of his equipment. Great stress is laid on the fact that where the sickness and death rates are high the proportion of doctors is low. The lower income groups need more medical care than the others, but they spend less on it and get less, even taking into account charitable services. The death rate of the population is also shown to be related to the means of its various groups. The most striking instance of this is to be found in the negro population, where the death rate for males is 75% higher than for the whites, and for females 74% higher. The negro has a lower expectation of life now than the whites had 40 years ago.

In the next instalment of this interesting inquiry the Committee will, no doubt, try to suggest means whereby some of these anomalies can be reconciled and every citizen given the medical services he must have if the general health of the community is to be improved. The little volume is full of information and suggestions for all interested in medical sociology.

PARENTAL RESPONSIBILITY

Home-Life and the Community. By Leslie George Housden, M.D. (Pp. 66. 3s. 6d.) London: Eyre and Spottiswoode (Publishers), Ltd.

As Dr. Housden points out in this small book, which is sponsored by the National Association of Maternity and Child Welfare Centres and for the Prevention of Infant Mortality, much has been written and said about the subject of juvenile delinquency, but all too little stress has been laid on parental responsibility for preventing the asocial behaviour of the young. The morality of the adult population is lamentably low, and almost everyone is much more concerned with what he can get out of the future than with what he can contribute towards it. Education is given in almost everything except in the general art of living, and for this lack both school and home are responsible. Returns of losses from trading concerns, railways, etc., show what an appalling amount of petty theft goes on every day. How then can the children be expected not to steal and lie with the continuous bad example of their elders and "betters" before them? Another important cause of delinquency is that many children find the days so dull that stealing or sexual adventures are the only spice in life. Parents ought to be more concerned to see that their children's lives are more full and satisfying. Similarly clubs should satisfy the needs of the children, including the asocial youngsters, and be less concerned with the suitability of the boy or girl for the club. If children are more valued, respected, and taken notice of in the home there will be less trouble in the street.

This is a valuable tract for the times, which should be read by every interested citizen.

Notes on Books

Manual of Nutrition (H.M. Stationery Office; 1s.) has been produced by the Ministry of Food with the purpose of setting out the elementary principles for the benefit of a growing number of people whose work involves the preparation and processing of food or the planning of meals. Just as a competent aircraft pilot must understand the principles of flight, so must a caterer, a supervisor of an institution, or a cook, whether in the home, school, hospital, or canteen, understand the principles of nutrition. Without a grounding in nutrition it is impossible to know whether diets are satisfactory or not. The manual is divided into twelve lessons. The first part of the lesson deals with the various types of nutrients (fats, carbohydrates, proteins, minerals, vitamins), their energy values, digestion, human nutritional requirements, the composition of various foodstuffs, cooking, and the planning of meals and diets. The second part of the lesson consists of practical work based on the first part. There are simple questions at the end and an appendix giving the composition of the commoner foodstuffs. The text is well written and set out, the style is crisp and lucid, and the manual should be easily understood by anyone of moderate educational attainments. If it reaches the right hands, it should do much to improve the nutritional value of meals and prevent good food being wasted by bad cooking. The Ministry of Food is to be congratulated on this excellent piece of work.

We have received from the International Labour Office (3480, University Street, Montreal) a copy of Provisional Bulletin No. 7, reporting transactions of the Inter-American Committee on Social Security. This includes a paper by Dr. Martha M. Elliott on the emergency maternity and infant-care programme in the United States.

Preparations and Appliances

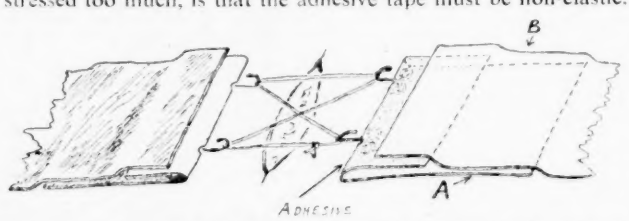
ADHESIVE CORSET DRESSING FOR GAPING WOUNDS

Dr. M. LICHTENSTEIN writes from Glasgow:

One very annoying complication of operative and, especially, abdominal surgery is the breaking down of a wound which had been stitched and considered healed. Often the starting-point of this breakdown is a ligature, sometimes a low-virulence infection of the subcutaneous fat, and occasionally excessive pressure from within the abdomen. Whatever the cause of the breakdown, it usually involves the thickness of the skin only.

The dressing of such a wound presents a complicated problem, using up great quantities of material and many reels of adhesive strapping, and taxing to the utmost the skill and resources of the nursing staff, often without achieving much progress.

The use of an adhesive "corset" dressing as described below simplifies dressing and, by relieving the tension on the skin, lessens the gap between the two edges of the wound and thus accelerates healing. One important point, which cannot be stressed too much, is that the adhesive tape must be non-elastic.



otherwise it would defeat its purpose. No authorship is claimed for the method, and it is being published only in the interest of those who might not have heard of it.

THE METHOD

1. Four strips of non-elastic adhesive tape, 2 to 3 in. wide and 6 to 8 in. long, are cut.
2. Two of the strips (A) have their ends doubled back, adhesive side outwards, and with a pair of scissors two or three little holes are cut in the line of the bend, for the hooks, which are then inserted, the loops of the hooks being hidden inside the non-adhesive part of the tape, while the business ends protrude from the adhesive surface.
3. These two strips are now applied, the adhesive surface adhering to the skin all along except for the terminal 2 in., which are doubled back, reaching to within 3 to 4 in. of the edges of the wound, the hooks protruding through the holes.
4. Now the other two strips (B) are applied on top of the first ones, to cover the adhesive surface of the first from just behind the hooks and to continue along the non-adhesive surface and further beyond it.
5. A lint or gauze dressing, with or without waterproof or cotton-wool, is now applied to the wound.
6. A narrow tape or lace can now be passed over the projecting 4 or 6 hooks and drawn tight, thus approximating the edges of the wound and promoting early union.

To change the dressing one has only to unlace the narrow lace, apply a new dressing to the wound and re-lace. The whole procedure of changing a dressing is thus completed in a few minutes. The hooks should be rather big, not less than about half an inch, and can be easily procured in any haberdashery shop. Their ends have to be slightly separated to allow for the thickness of the tape.

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THE REPRESENTATIVE MEETING

It is another sign of the return to normal conditions that the Annual Representative Meeting (reported in this week's *Supplement*) should have got back to its old place in the calendar, at the end of July, although the peripatetic habit of the Association of holding its Annual Meetings in different towns cannot yet be restored. But the fact that the previous Annual Representative Meeting took place less than eight months ago naturally lessened the amount of business to be transacted last week, and there was some speculation whether the meeting could extend itself over the three days allotted to it. Moreover, the negotiations over the proposed National Health Service, which have been the great preoccupation of recent months, were dealt with at a Special Representative Meeting held as recently as May. The proceedings last week were described as dull, pedestrian, and domestic. They might be likened to a plain between two peaks, one of which—namely, the shaping of the Association's policy on the Government proposals—has already been scaled, while the other, of unknown height and contour, remains to be tackled. On the last day of the meeting, with the Election results announced from hour to hour, this further peak suddenly loomed out of the mists to assume a precipitous and somewhat forbidding aspect. At the very moment when it was announced that the country had given a firm mandate to a Labour Government the meeting was engaged in the only internal controversy which disturbed it. A motion was brought forward from one Division which implied a criticism of the "platform" for its alleged habit of instructing, instead of being instructed by, the floor. The motion found little or no support in the meeting, but it led to a plea from a familiar quarter to have done with such carping in view of the obvious need for a united front now that a Government was to be in power with a salaried State medical service as one of its objectives.

The debate on the National Health Service proposals, to which an afternoon was devoted, covered much ground already fought over, and from which the slain had scarcely been removed. The proposal of a corporate body for the control and administration of the new service again came forward. One of the features of a debating assembly is that a settled issue has only to appear in a new form for the subject to be reopened. In this way greater wisdom may come from fuller discussion. The motion for a corporate body was again rejected, as was a motion that the control of the service should be vested in some other quarter than the Ministry of Health. The other big debate was on a proposal by Belfast that all persons compulsorily insured in the new service should have a right to "opt out," and, moreover, should receive a financial grant towards their private contract. This motion was carried by a majority of forty. The ruling of the platform was that it was not considered a reversal of Association policy. Even had it been so considered it would just have failed to secure the necessary two-thirds majority. But in view of the upsetting of the chessboard owing to the new political situation these debates seemed a little unreal.

The question of the demobilization and return of doctors to their practices was very much in mind throughout the meeting. It was also the theme of Mr. H. S. Souttar's presidential address—the shortest and most succinct address ever made from the chair of the Association. He declared that the release of men from the Forces and their re-establishment in civil practice is the most important problem facing the profession at the present time. He also spoke of the inadequacy of the Government offer of refresher courses for such released officers; he hopes to see it made into something much bigger and the starting-point of a great future system of postgraduate education in which all will share. As for re-establishment in practice, Mr. Souttar did well to point out that, whilst some fortunate ones will come back to a place waiting for them, in partnership or otherwise, many others will experience financial difficulty in resettlement, and the giving of adequate and unstinted help to these men is no matter of charity at all but the payment of a general debt and the setting of a seal to the brotherhood of the profession.

A good deal of impatience was expressed by various speakers in the Representative Body at the tardiness of release from the Forces, and a resolution was passed, without dissent, recording dissatisfaction with the present demobilization scheme. More than one speaker pointed out that the civilian medical profession is ageing: it is tired and overworked; it has had no replacements: it has given up to the Services its most active and valuable men, those in early middle age. Col. Proctor told a sombre story of the estimated present demands of the Services for medical personnel, stressing the need of the Army for the Japanese War. The Chairman of Council gave a hint of the pressure which the Association was bringing to bear upon the Government to secure speedier release and a long-term programme. The position of Service medical officers, without information as to the probable date of their return to civilian practice, was intolerable. Better news might be forthcoming in the next few weeks.

The Representative Meeting bade farewell to Dr. Peter Macdonald, who had presided over six Representative Meetings, three annual and three special—a more crowded term than has fallen to any chairman since the introduction of National Health Insurance, when nine Representative Meetings were held within about two years. For the dignity, ability, and courtesy with which he has presided he richly deserved all the praise that was given to him. He is succeeded by Dr. J. B. Miller, of Bishopbriggs—not, as some newspapers called him, the first Scottish chairman, for the retiring chairman himself is a son of Aberdeen, but the first Scottish practitioner to take that office. He

will have an excellent deputy in Dr. E. A. Gregg, who has gained his spurs in his long chairmanship of the Insurance Acts Committee.

MILK STILL UNSAFE

What was on the whole rather a dull Annual Representative Meeting was enlivened by Mr. Lawrence Abel's forthright onslaught on the Government for what the Chairman of Council described as its criminal negligence in allowing the public to consume contaminated milk. Mr. Abel was all for hanging on the nearest lamp-posts ex-Ministers of Health and their permanent officials—and by this effective device of exaggeration expressed the disgust of the medical profession at the callous inertia of officialdom. As Dr. Dain observed, you can be punished for adding water to milk, but not for infecting the unprotected consumer with it. A recent answer in the "Any Questions?" section of the *Journal* has brought to light a scandal that needs exposing.

In a White Paper two years ago the Government announced its intention of taking power to exercise closer control over the quality of milk as it reached the consumer.[1] The Minister of Food was by Regulation to make it an offence to sell milk in any area which he might schedule unless the milk was either heat-treated or from disease-free animals. The White Paper was followed by a Defence Regulation (55G) giving the Ministry power to specify the areas in which only such milks might be sold. But now, as the result of an inconspicuous question and answer in these columns, we have it disclosed by a senior medical officer of the Ministry of Health that no such areas have yet been specified, and that even if any areas are specified before the Regulation is annulled they will not cover the whole country. One is left wondering what secret history lies behind this extraordinary example of departmental bad faith.

In 1943 the Government seemed to be acutely alive to the dangers of milk. In February of that year Lord Woolton, then Minister of Food, received an important deputation, led by the British Medical Association, which pressed on him the need for pasteurization of milk as the only practicable safeguard without serious disadvantages.[2] The chief spokesman of the deputation, Prof. R. M. F. Picken, now President of the Society of Medical Officers of Health, declared that few questions in preventive medicine commanded the same unanimity of approval as pasteurization. Lord Woolton was obviously impressed. He said he found it difficult to resist the weight of scientific and professional evidence which had been assembled. He recognized fully the obligation of the Government to obtain a milk supply which could do no harm, or alternatively to issue instructions as to how people could obtain reasonable security. A few months later, in July, speaking in the House of Commons, Mr. Robert Hudson, then Minister of Agriculture, declared it to be the Government's intention to prohibit in areas to be scheduled the retail sale of milk which did not belong to one or other of the three categories: T.T. milk, "accredited" milk from a single herd, and milk rendered safe by means of heat treatment. In the House of Lords Lord Woolton was even more explicit. He said that within a year and a half the Government would be able to ensure a pasteurized supply to cover the whole country where rationalization schemes of milk delivery had been introduced. In other words, wherever bulked milk was sold it would be pasteurized. The eighteen months of Lord Woolton's prediction expired last January, and it is now August. But all these fine promises have come to nothing, and the medical man who sees his patient die from infected milk is sickened by this example of political callousness.

It is true that Parliament has shown reluctance to make pasteurization compulsory, and that there are milk-selling farmers who hold the view expressed by one of them that if Nature had intended milk to be pasteurized she would have arranged that it came pasteurized from the cow. They might as well have asked themselves whether Nature intended cow's milk to be drunk by any animal other than the calf. But a wartime Government has overridden many prejudices and obscurantism among its supporters in Parliament and in the country, and it certainly seemed from the attitude of Ministers in 1943 that the battle for pasteurization had been won, and that the only obstacle was the lack of adequate facilities in some areas. In the answer given in this *Journal* which elicited the revealing comment from the Ministry of Health it was stated that "legislation" had been passed which would make it compulsory for all milk, with the two exceptions already named, to be pasteurized. The word "legislation" was not strictly accurate if an Act of Parliament is meant, but with a Government virtually having dictatorial powers the undertaking of Ministers that a certain thing will be done within a given time, which undertaking was followed by a Defence Regulation to the same effect, is in these days "legislation" enough. The Defence Regulation was issued. On January 25 of last year Col. Llewellin, who in the meantime had become Minister of Food, told the House of Commons that the new Regulation imposed restrictions on the sale of raw milk in certain areas. But apparently the Regulation is just a scrap of paper. It named certain milks which alone might be sold in specified areas, but no area has ever been specified. It would have amounted to the same thing had it named certain areas in which only specified milks might be sold, and then had failed to designate the milks. This is surrealism at its most subconscious.

The matter is the more strange because every effort was to be made to enlist the co-operation of the trade. Pasteurization admittedly adds to the cost of milk—2d. a gallon, or over £10 million a year—though the cost is trifling compared with the preventive value of the procedure. Indeed, considered in a large way, pasteurization should be regarded as a great economy for the dairying industry, eliminating much of the unnecessary duplication of milk rounds which still exists in many places. In any case the dairyman and retailer were to receive the full remuneration guaranteed by the Government to milk producers and the full margin allowed to retailers. Not only so, but the local

[1] "Measures to Improve the Quality of the Nation's Milk Supply." Cmd. 6454. 1943.
[2] *British Medical Journal*, Feb. 27, 1943.

associations of dairymen and producers, who had already been requested to prepare plans for the rationalization of retail distribution, were to be asked further to submit plans for organizing in their districts the heat treatment of milk. If the trade could not make the necessary arrangements the local authority was to step in and install and operate pasteurizing plant, being treated as wholesalers for the purpose. All this was in the White Paper. How much has been done in these directions we do not know, but the fact remains that the compulsion plainly indicated in the Ministerial statements in 1943 has not—to use the official jargon—been implemented.

We are left to speculate what the drag on the wheel may be—departmental lethargy or the opposition of agricultural interests. The Ministry of Agriculture was never conspicuous for its zeal in the battle for clean and safe milk, but a prominent officer of the Ministry in a debate on the subject at the Royal Society of Medicine in the present year[3] said that if there were medical officers who thought there was opposition to pasteurization from the veterinary point of view they might be reassured. He left it to be inferred that in the view of his Ministry pasteurization was not an agricultural problem but a matter to be decided on medical grounds. Public health was the touchstone. Another dairying authority, Prof. H. D. Kay, director of the National Institute for Research in Dairying, has declared that the pasteurization bogy is now satisfactorily laid.[4] Careful scientific experiment extending over some years, he says, has shown that properly controlled commercial pasteurization causes practically no nutritional damage to milk. "In the near future"—this was in 1942—"it will almost certainly be a national requirement that all milk sold for liquid consumption shall either be effectively pasteurized or shall be from disease-free animals."

It is to be hoped that the new Parliament will have a quickened conscience in this matter. R. L. Stevenson said that politics is the only profession for which no preparation is thought necessary. If, as would happen in the ideal State, our new legislators underwent a period of intensive education, this should include a visit to an orthopaedic hospital or children's sanatorium. One-third of the deaths from tuberculosis in children under 5 years are due to the bovine organism—2,000 deaths a year, with, of course, a much larger incidence of invalidism and crippling. The American troops in this country have not been allowed to drink milk unless it was both from tuberculin-tested herds and had been pasteurized; yet, so far from insisting on the double protection, we do not even make universal the simpler of the two expedients. It is an amazing thing that, despite all the "safe milk" campaigns and all the apparatus of inspection and control, some part of the British public should still be exposed to the perils of raw milk. Is it too much to demand compulsory pasteurization in all areas, and, pending the availability of pasteurizing plant in any district, an official intimation to the public that milk must be boiled before its consumption is allowable?

[3] *British Medical Journal*, March 10, 1945.
[4] *Nature*, July 11, 1942.

LABOUR AND MEDICINE

We record elsewhere in this issue the successes and failures of the 37 doctors who stood as candidates in the recent Election. Of the 13 returned there are 9 Labour members, 2 Conservatives, and 1 Liberal National. Sir Ernest Graham-Little (Independent National) has been re-elected as the representative of London University. The Election results for the Combined Scottish Universities are to be announced after the *Journal* has gone to press.

Before it had been decided to hold an Election in July it was thought that negotiations with the Minister of Health on the White Paper had reached such a stage as to make the presentation of a Bill to Parliament a likelihood before the end of the recent session. There would have been one great advantage in this, and that is that the contents of the Bill would have been determined with a Government in which political forces were more or less evenly balanced. But now that the Labour Party is in power with a large majority we may find the results of prolonged and difficult negotiations "in the discard." The Labour Party's policy on a "National Service for Health" is set forth in a 24-page pamphlet published in 1943.[1] This pamphlet began with two questions: (1) "Do we need a State Medical Service?"; (2) "If so, on what lines should it be planned?" In the chapter purporting to give the reasons why a State Medical Service is necessary there are two sentences which crystallize the view of the Labour Party and provide an answer to the questions which must now be exercising the minds of all medical men in Great Britain. They are these:

> "(1) We said that the system must offer *a fair deal to doctor and patient* alike; but we found that only a system of whole-time, salaried, and pensionable doctoring would meet these requirements."
>
> "(2) Do you not agree with the Labour Party that the Medical Service should be developed, as rapidly as conditions permit, into a State Medical Service, as part of a comprehensive National Service for Health?"

It may, of course, happen that the new Government will instruct the new Minister of Health to continue negotiations at the point where Mr. Willink left off. But the antagonistic attitude of left-wing papers to the B.M.A. does not encourage this view. So our negotiators, who are all busy practising their profession at a time of acute shortage of doctors, are presumably to be faced with the prospect of going over the same ground again. According to its declared policy, the Labour Party is anxious to give a fair deal to the medical profession, and expresses the hope that "the Medical Service should be so organized as to enable the medical profession to pull its weight effectively in all those tasks of a democratic government which affect the nation's health." That doctors do want to make their weight effective was strikingly shown at last week's A.R.M. debate on the pasteurization of milk. The attitude and action of a Labour Minister of Health on this question will be for the profession a touchstone of the sincerity of the above statement of policy.

If the organized medical profession is to have a really effective voice in shaping a service which will be a potent force in preserving the health of the nation then it must be consulted at each stage of development, and must be adequately represented at all levels of administration. When we look at the Labour Party's plan of organization some things stand out on which there would be little disagreement—for example, the proposal to concentrate in one Health Ministry all those health services now controlled

[1] Transport House, Smith Square, London, S.W.1. Price 2d.

by other Government Departments, and to separate from the Ministry all those services which affect health only indirectly. But there is little in these proposals to suggest that the Labour Party really intends the medical man to pull his weight. He cannot do this if, for example, he is excluded from the proposed Regional Health Committees, and if he is suffered to act only in an advisory capacity at this and other levels of administration. Lastly, there are two points of policy which will be of concern and interest to both the general practitioner and the consultant. The first is a suggestion that it is not possible for it to meet the present situation by extending the National Health Insurance Scheme; the second is the statement that "before long the voluntary hospitals will come under the control of the local authorities, and [that] conditions of service and staff in all the hospitals will become standardized."

PSYCHOSIS DUE TO MEPACRINE

It is now common knowledge that the success of the Allied Forces in the Pacific in withstanding and then routing the Japanese invaders was greatly endangered in the earlier stages of the war by malaria, and that this danger has now been overcome mainly by the prophylactic use of mepacrine (atebrin). Mepacrine was first synthesized by the Germans in 1932, and its availability in 1942 (when the supply of quinine was cut off by the loss of Java) was an important factor in defeating Germany's ally. All powerful drugs have their disadvantages, and mepacrine is no exception: attention has been recently drawn again to the cerebral disturbances which occasionally follow its use.[1] These disturbances have been noted at intervals ever since mepacrine was first used, but they are not common. Thus Kingsbury[2] observed 12 cases of psychosis among thousands of Malayans who had been treated; and Hoops[2] had only one case of mental excitement among 1,207 cases of malaria treated. On the other hand, during the Ceylon malaria epidemic of 1935 Briercliffe[2] recorded that 15 cases of delirium developed among some hundred persons who took the drug by mouth. Bispham[3] in 1941 analysed the toxic effects seen when 49,000 cases of malaria had been treated with mepacrine; he noted that cephalalgia, mental depression, delirium, psychoses, and convulsions may occur, but the rate of incidence was very low. Field[4] estimated the occurrence of mepacrine psychosis as less than 0.1% of cases treated; the symptoms began just before or just after the end of treatment; the patients showed signs of excitement, confusion, or even mania, and the symptoms gradually subsided, after having lasted for approximately one week. Cerebral disturbances have occasionally occurred in the Australian Forces, but they have been rare and have usually appeared in men who had taken excessive amounts of mepacrine during self-medication.

The cases reported in a recent paper by Gaskill and Fitz-Hugh[1] of the American Army occurred on fairly low doses—namely, 2.1 g. given during about 6 days in the treatment of acute attacks of malaria. The symptoms, though interesting, were quite rare, affecting only 35 men out of 7,604 who were treated—i.e., only 0.4%. The onset took place between the third day after the beginning of treatment and the twelfth day after its end. There were two main types. In one there was an abrupt change of behaviour with an increase in motor and psychomotor activity; sometimes hallucinations, delusions, and disorientation occurred; the general impression was of euphoria and expansiveness. In the other type there was a gradual and insidious onset of retardation of the mind and confusion; there was a gradual clouding of the sensorium, with disorientation and loss of recent memory; the patients were withdrawn and seclusive; and the general picture was one of bewilderment and fearfulness. Laboratory tests showed nothing abnormal. Treatment was palliative. Thirty-three of the 35 patients recovered completely, the average time needed being 23 (8–85 days). When the return to normal behaviour began it was completed quickly in one to two days. Subsequently half of these patients were given the same course of mepacrine again, and no serious symptoms occurred. As regards diagnosis, the chief point is to exclude cerebral malaria, which should be suspected in all cases of peculiar mental reaction in the Tropics until disproved. In psychosis due to mepacrine it should be noted that the patients have recently received antimalarial treatment, that the slight initial fever which may be present in a few cases subsides in 12 to 24 hours, that the symptoms are all psychiatric, that the behaviour pattern remains constant, and that there is no objective neurological disturbance. The explanation of these cases is not clear. It is known that very large doses of mepacrine cause mental disturbances even in normal persons; but in the patients just described the dose was not abnormally high. Probably a combination of mepacrine, malaria, personal idiosyncrasy, and the hardships of warfare may be involved. Whatever the cause, it should be remembered that these toxic effects are rare and relatively unimportant compared with the damage which can be caused by malaria. It is interesting and useful to know that they can take place, but their possibility should never deter the confident use of this valuable prophylactic and therapeutic antimalarial compound.

[1] Gaskill, H. S., and Fitz-Hugh, T., jun., *Bull. U.S. Army med. Dept.*, 1945, **86**, 63.
[2] *Bull. Hlth. Org. L. o. N.*, 1937, **6**, 895.
[3] *Amer. J. trop. Med.*, 1941, **21**, 455.
[4] *Bull. Inst. med. Res. Fed. Malay States*, 1938, No. 2.

CARE OF THE AGED

Realization that we are faced with the prospect of an increasing proportion of the aged in our population has had medical and social effects, which are naturally intertwined. The books reviewed in our columns show how much attention is being paid to the study of "geriatrics," while recent correspondence in the *Times* (July 7, 9, 11, 12, 14, 16, 17) gives an impressive idea of the efforts now being made to grapple with the social problems involved. Indeed, so many agencies seem to be at work that there may be some risk of overlapping, for there is little evidence of co-ordination in these beneficent enterprises. It is, however, clearly recognized that different types of homes are needed for the widely different classes to be catered for, varying from complete hospital facilities to provision for single persons or married couples. The Westminster Housing Association, for instance, prefers mixed communities to a segregated colony of aged people alone. There is a large class who long for the independence of their own room and latchkey, with their own "bits and pieces." Institutional life is not for them if they are to remain in any way content, and this other plan is the one favoured by the Church Army housing committee. Now that interest has been so thoroughly aroused and the importance of the subject realized one may fairly hope that funds will be forthcoming and that our national capacity for adapting means to ends will declare itself in this much-needed work.

The Central Medical War Committee is informed by the Director-General of Medical Services of the R.A.F. that under Class A of the reallocation scheme Groups 1 to 8 will be released by September, Groups 9 and 10 during September, Groups 11 and 12 in October, Groups 13 and 14 in November, and Group 15 in December. This is the minimum rate of release, and if the rate of general release in the Service is speeded up the rate of release of medical officers will be speeded up also.

THE RETURN OF THE DOCTOR*

BY

H. S. SOUTTAR, C.B.E., M.Ch., F.R.C.S.

President of the British Medical Association

I am confident that I shall meet with general support if I say that the most important problem facing our profession at the present time is the return of medical men from the Forces. It presents two aspects—their release from the Forces and their establishment in practice—and as both these aspects have engaged the attention of the Association for many months I felt that they would form an appropriate subject for a short presidential address. Both aspects involve problems of the greatest complexity to which I can refer only in the briefest outline, but I hope to be able to convince you that these problems are being attacked with the whole power of the Association and that with the good will of all of us they will be solved.

Classes for Release

Release from the Forces must follow the plan laid down for demobilization in general and falls into two classes: Class A being the general routine, Class B dealing with special cases. So far as is possible releases should be in Class A, which depends entirely on age and length of service, for any departure from this means that men will be delayed from release in their proper category. Even, however, where a category is due for release, and particularly in the case of specialists, it may be impossible to effect this without substitution. For this reason it is imperative that the recruitment of young practitioners should continue, and that all the available specialists up to the age of 35, or in some cases even 40, who have not already served in the Forces should be prepared to take their turn.

In Class B release may be obtained for those who are urgently needed for work of national importance—in some cases for civilian needs of extreme urgency, in others for the teaching staffs required for the training of students, both undergraduate and postgraduate. These must, however, be jealously guarded, as a large number of releases out of turn in Class B means a delay in Class A. Released doctors will fall into three classes.

Class I consists of those who joined the Forces soon after qualification. In general these men have held a short hospital appointment, but before joining up they had only a very limited clinical experience, and they require further experience under supervision before engaging in practice. Others in this group were on their way to a university degree, but were prevented by recruitment from achieving it. It is the intention of the Government that for all these there should be available hospital appointments carrying a salary of £350 a year and all found, and with special family allowances for those who require it. Such an appointment held for six months, with its opportunities of clinical experience under skilled supervision, would be of inestimable value at such a critical moment in a young doctor's career. If he wishes to go into practice it will give him the opportunity of looking round and finding a congenial opening; if he wishes to take a higher degree it puts him well on the way towards this. It is estimated that the number of individuals in this class is now about 10,000, but, of course, they will only appear in limited numbers as demobilization proceeds.

Class II consists of those who were engaged in general practice before recruitment. Naturally their first anxiety will be to get back to their practices, and to this they will undoubtedly be urged by their overworked colleagues. Many of them will, however, feel the need for refresher courses so that they may regain their clinical touch in civilian work, which is so utterly different from work in the Army, and so that they may learn something of recent advances in medical science. The Government offers a completely inadequate period of two weeks, but they agree that the refresher course may be taken at any time within a year of release, that travelling and subsistence expenses will be paid, and that the cost of employing a locum will be provided if necessary. Whatever the views of the Government, we hope that the hospitals will see that adequate courses of at least a month are provided, and that these are so arranged as to meet in every way what is needed. The urgent need for our future medical service is to be efficient. One may indeed hope that such refresher courses may only be a starting-point of a great future system of postgraduate education in which all of us will share, and that they may initiate the close co-operation between our hospitals and general practice to which we look forward in the future.

Class III consists of those who are aiming at a specialist career and who wish to pursue it on their release. For them posts of the registrar type will be found, especially in the teaching hospitals, and they will be paid £550 a year with board and lodging. Arrangements for these appointments—and this applies also to Classes I and II—will be made through the universities, and it is already generally agreed that the experience which the candidate has already gained will be counted towards the requirements for entry to the higher examinations, and will receive consideration from those whose duty it is to conduct examinations.

Back to Practice

There still remains the problem of establishment in practice, and here the responsibility shifts from Government Departments and examining bodies, and must be accepted by ourselves. It is we who must make the path smooth for the returning doctor, and more especially for those who are entering general practice for the first time. Some fortunate men will return to a share in an established practice, where they will be welcomed with more than open arms. Some 10,000, however, will have to find openings, and without our help they may not find it too easy. Much careful study has been given to their problems, and they will find the Association ready with full information of the openings available and prepared to give not only advice but very substantial help. Assistantships can be arranged at once, and if these mature into a mutual desire for partnership provision can be made for the necessary finance. If, for example, a doctor without capital desires to purchase a practice arrangements can be made through the services of the Medical Insurance Agency by which he can obtain the whole sum required at a low rate of interest. Such an arrangement offers a double advantage, for not only does it benefit the young practitioner setting out on his career, but it also relieves the anxieties of the older man who has held the fort so magnificently against all the odds of age and overwork until the young man could return.

There will still remain difficult cases in which all the help that can be given from official sources must be quite inadequate. To meet such cases in the early days of the war we instituted a Medical War Relief Fund, which has reached the sum of £54,000, of which £24,000 has already been spent in relief. After what I have seen for myself of the amazing relief which has been brought to individual cases by this fund I would urge that now is the moment to raise it to an amount commensurate with the occasion, and that we should use this opportunity to prove to those who have given such great service to their country that we appreciate what they have done and will give them all the help that they have so fully earned.

Here is no question of charity; rather is it the payment of a debt that we owe; but most of all we should be setting our seal to the brotherhood of our profession and to our determination that those who have suffered through no fault of their own shall be able to turn for support to those of us who have been more fortunate. I should like to see the fund raised to such a sum as will ensure that we shall be able to give to all those who need it the adequate and unstinted help which I know we all desire. Ours is a great profession. Let us see to it that in the years to come it is a great brotherhood.

* A brief address on his election to the Presidency of the Association at the Annual General Meeting on July 25.

An educational lecture on oxygen therapy is available to medical superintendents, sister tutors, and other lecturers. It traces the history of oxygen therapy, the principles and applications, and the forms of apparatus in use to-day. The text is supplied in typescript written in a style suitable for presentation to doctors, nurses, and students, and takes about 40 to 45 minutes in all. A series of lantern slides accompanies the text and illustrates the manufacture of oxygen, the installation of oxygen in hospitals, and various types of apparatus used from the most primitive form to the latest design. Details of the lecture—which is loaned without charge—may be had from Oxygenaire Ltd., 8, Duke Street, Wigmore Street, London, W.1.

THE GENERAL ELECTION

MEDICAL MEMBERS OF THE NEW PARLIAMENT

Of the 37 medical men and women who stood as candidates for Parliament at the recent General Election 13 were elected. Of these 9 are members of the Labour Party, 2 Conservatives, 1 Liberal National, and 1 Independent National. (The result of the Combined Scottish Universities Election had not been received at the time of going to press.)

The following 6 medical candidates who were members of the last Parliament have been re-elected: Sir Ernest Graham-Little, Dr. L. Haden Guest, Dr. H. B. Morgan, Sir Henry Morris-Jones, Major B. Neven-Spence, and Dr. Edith Summerskill.

SUCCESSFUL CANDIDATES: POLLING FIGURES

WEST HAM (SILVERTOWN):

Dr. L. Comyns (Lab.)	**9,358**
Squadron Leader E. Elverston (C.)	494
Capt. A. Davies (Ind.)	401

LONDON UNIVERSITY:

Sir Ernest Graham-Little (Ind. Nat.)	**7,618**
Mrs. Mary Stocks (Ind. Prog.)	7,469

ISLINGTON (NORTH):

Dr. L. Haden Guest (Lab.)	**23,234**
Capt. C. Rhys (C.)	11,240

BARKING:

Dr. Somerville Hastings (Lab.)	**24,504**
K. E. B. Glenny (C.)	5,593
C. H. Willcock (L.)	4,674

ST. PANCRAS (SOUTH-EAST):

Dr. S. W. Jeger (Lab.)	**10,030**
Sir A. Beit (C.)	5,320
Mrs. A. Blackman (L.)	1,474

ROCHDALE:

Dr. H. B. Morgan (Lab.)	**22,047**
Wing Cmdr. E. M. Nicol (C.)	16,852
C. G. C. Harvey (L.)	10,211

DENBIGH:

Sir Henry Morris-Jones (L. Nat.)	**17,023**
Wing Cmdr. G. Evans (L.)	12,101
Lieut.-Cmdr. W. L. M. Jones (Lab.)	11,702

ORKNEY AND SHETLAND:

Major B. Neven-Spence (C.)	**6,304**
Major J. Grimond (L.)	5,975
P. J. L. Smith (Lab.)	5,208

PRESTON (2 seats):

Squadron Leader S. Segal (Lab.)	**33,053**
J. W. Sunderland (Lab.)	32,889
Major R. Churchill (C.)	29,129
Capt. J. Amery (C.)	27,885
Flight Lieut. J. M. Toulmin (L.)	8,251
P. J. Devine (Comm.)	5,168

YORKSHIRE, WEST RIDING (PUDSEY AND OTLEY):

Lieut.-Col. M. Stoddart-Scott (C.)	**22,755**
Major D. W. Healey (Lab.)	21,104
Brig. T. Clarke (L.)	8,592

STOKE-ON-TRENT (HANLEY):

Dr. B. Stross (Lab.)	**21,915**
Capt. J. P. A. L. Doran (C.)	10,313

FULHAM (WEST):

Dr. Edith Summerskill (Lab.)	**19,537**
Wing Cmdr. P. B. Lucas (C.)	12,016

HERTFORD (BARNET):

Dr. S. J. L. Taylor (Lab.)	**17,764**
Brig. A. E. J. Clarke (C.)	17,082
Miss J. M. Henderson (L.)	4,495

Medical Candidates Not Elected

The following members of the medical profession were defeated at the polls. Several had previously represented or contested either the same or other constituencies. An asterisk denotes that a candidate sat in the last Parliament.

Surg. Lieut.-Cmdr. R. F. B. Bennett (C.), Woolwich (East).
Mr. L. Graham Brown (L. Nat.), Bedford (Luton).
Lieut.-Col. Leonard F. Browne (Lab.), Cumberland (Penrith and Cockermouth).
Flight Lieut. H. B. O. Cardew (Lab.), Somerset (Weston-super-Mare).
Dr. D. J. Cavanagh (Irish Nat.), Londonderry.
*Sir J. Douglas Cooke (C.), Hammersmith (South).
*The Rt. Hon. Walter E. Elliot (C.), Glasgow (Kelvingrove).
Major G. A. D. Gordon (L.), Richmond.
Dr. B. Guyster (L.), Leyton West.
Surg. Cmdr. J. J. Hayward (Nat.), Monmouth (Abertillery).
Dr. Charles Hill (Ind.), Cambridge University.
Dr. T. Rowland Hill (L.), Cornwall (Camborne).
Dr. Elizabeth Jacobs (Lab.), St. Marylebone.
Dr. E. F. St. J. Lyburn (Ind.), Kent (Tonbridge).
*Dr. R. D. MacIntyre (Scot. Nat.), Lanark (Motherwell).
Dr. G. C. Milner (Ind.), Kent (Orpington).
Dr. D. Stark Murray (Lab.), Richmond.
Dr. W. B. J. Pemberton (L. Nat.), Bermondsey (West).
Dr. Dorothy A. Sharpe (C.W.), Chelsea.
Major R. Scott Stevenson (L. Nat.), Fife (West).
*Dr. W. S. Russell Thomas (L. Nat.), Southampton.
Flight Lieut. R. N. Tronchin-James (L.), Reading.

BRITISH MEDICAL ASSOCIATION

Scholarships in Aid of Scientific Research

Scholarships

The Council of the British Medical Association is prepared to receive applications for research scholarships as follows: an Ernest Hart Memorial Scholarship of the value of £200 per annum, a Walter Dixon Scholarship of the value of £200 per annum, and four research scholarships, each of the value of £150 per annum. These scholarships are given to candidates whom the Science Committee of the Association recommends as qualified to undertake research in any subject (including State medicine) relating to the causation, prevention, or treatment of disease. Preference will be given, other things being equal, to members of the medical profession. The scholarships will be tenable for nine months in the first instance, commencing on Jan. 1, 1946. A scholar may be reappointed for not more than two additional terms of one year each. A scholar is not necessarily required to devote the whole of his or her time to the work of research, but may be a member of H.M. Forces, or hold a junior appointment at a university, medical school, or hospital, provided the duties of such appointment do not interfere with his or her work as a scholar.

Conditions of Award: Applications

Applications for scholarships must be made not later than Saturday, Dec. 1, 1945, on the prescribed form, a copy of which will be supplied on application to the Secretary of the Association, B.M.A. House, Tavistock Square, London, W.C.1. Applicants are required to furnish the names of three referees who are competent to speak as to their capacity for the research contemplated.

SOCIETY OF BRITISH NEUROLOGICAL SURGEONS

This society held its 33rd meeting in Edinburgh under the presidency of Mr. Norman Dott on June 1 and 2, 1945. It is proud of its record, having met at least once in each of the war years. Naturally, difficulties of travel prevented the usual round of visits which the society used to pay, and all its previous wartime sessions have been in London or in Oxford. The Edinburgh session was a great event, for not only were the papers of outstanding scientific interest but the feeling of tension and urgency that marked late occasions was abated. A few papers of special importance were Prof. D. K. Henderson's on the advantages of prefrontal leucotomy, Dr. Paterson's on psychiatry on an organic basis, the description by Mr. Alexander of the operation devised by Mr. Dott and himself for the relief of spinal compression in Pott's disease, and the account given by Mr. Dott and Dr. Blackwood of the clinical and pathological effects of too-heavy doses of *x* rays on the brain and of radiosensitivity of meningiomas. Since these and other papers of equal merit will be published eventually there is no need to enumerate them in full. By special request Lieut. Pudenz, of the U.S. Naval Medical Service, showed his fascinating colour film of brain movements during head trauma. The collaboration of the British Medical Research Council and the American Board of Scientific and Medical Research had made this visit possible. It was greatly valued by all who took part.

Correspondence

Toxic Properties of Sting-ray's Sting

SIR,—In a recent paper by Dr. E. W. Gudger entitled "Is the Sting-ray's Sting Poisonous? A Résumé showing the Development of our Knowledge that it is Poisonous"[1] a full account of my work on the spine of *Trygone pastinaea* has been given, but the author concludes this description with the following remark: "While Evans made no experiments as to the poisoning nature of the spine and the products of the glandular tissue, he submits that the acute pain, inflammation, and paralysis are similar to the symptoms produced by the stings of other venomous fishes with which he experimented." Living trygones are rare on the East Coast fish markets and my material has been usually obtained from the South Coast and forwarded to me by the staff of the Ministry of Agriculture and Fisheries who live in those parts. This accounts for the omission of experimental evidence of the toxic properties of the stings.

Recently Fl. Lieut. J. Fawcitt, of R.A.F. India Command, has sent me some very valuable observations on the effects of wounds by the cordal spine of the sting-ray, prevalent in the Bay of Bengal. He has given me permission to publish his clinical notes on cases he has observed.

"During the four months I was in charge of a sick-quarters on the shores of the Bay of Bengal I saw and treated a number of cases of sting-ray and jelly-fish stings. The cases described below are typical of those observed by other medical officers in the area, as well as by myself.

While bathing thigh deep in the sea I was stung on the right ankle by a sting-ray. The weapon was not left in the wound. There was a stab incision just in front of the internal malleolus of the right ankle. There was practically no haemorrhage from the sting, and the edges of the wound looked bluish and bruised. The initial pain was severe and localized, though the whole limb felt numb. Three-quarters of an hour after the sting there was onset of pain on respiration, which rapidly increased in severity until even shallow breathing was extremely painful. This was followed in an hour and a half by intermittent spasms of the abdominal muscles, which rapidly increased in frequency until they became almost continuous. In addition there were extreme restlessness, nausea, tingling of the extremities, and slight dizziness.

Within four hours the pain was so severe that morphine was necessary, and half a grain was given orally. This was followed by two attacks of vomiting, and the pain was so little relieved that a further third of a grain was given hypodermically. Following this a certain amount of restless sleep was obtained during the rest of the night. After fifteen hours intercostal pain on respiration and marked spasm of the abdominal muscles were still present, and did not disappear for three days. Constipation was an added discomfort.

Though the site of the sting was never intensely painful except immediately after the initial stab, a chronic ulcer developed, which took 16 days to heal. Though it is difficult to view pain objectively in oneself, other victims have unanimously agreed with me that it was the most severe pain they had ever experienced."

The description of a case of a man stung severely by jelly-fish is also given in the same letter as follows:

"An airman was stung on both thighs by a large jelly-fish, and was admitted to sick-quarters within twenty minutes. He described the sting as being like red-hot wires drawn across the front of his thighs. He was a man of poor physique; there was intense pain with a moderate degree of shock; temperature 99° F.; pulse 100. On the anterior surface of his thighs there were large, reddened, oedematous patches, with cord-like raised areas where the tendrils of the jelly-fish had swept across them. There was already marked abdominal rigidity, respirations were shallow and rapid, and there was intense intercostal pain.

For want of any other remedy spirit. ammon. aromat. was immediately applied to the stings, and this completely abolished the local pain though it did not affect the generalized symptoms. These were relieved by a third of a grain of morphine hypodermically, though a further injection was necessary six hours later. Eighteen hours after the sting acute intercostal and abdominal pain were still present; the patient had vomited twice during the night, and complained of nausea and restlessness. The symptoms gradually wore off, but did not finally disappear until the sixth day.

There were two striking factors in this case that I found present in all severe cases of sting-ray and jelly-fish stings that I saw: (1) abdominal rigidity of a degree that is only normally seen in an acute abdominal catastrophe; (2) constipation that was so stubborn that an enema was necessary on several occasions."

These observations are very important, and they tend to show that the poison in both the sting-ray and jelly-fish are very similar in their clinical effects. It is known from the work of many investigators that there are two toxic substances in the sting of jelly-fish—namely, congestin and thallassin—which will be found fully described in the classic work by Marie Phisalix, *Les Animaux Venimeux et les Venins*.

It can be argued from this that, although the venom of the sting-ray has not been examined in the same way as that of the jelly-fish, it is probable that it is of the same nature. It also tends to disprove the contention of earlier observers that the sting of the ray was poisonous only on account of the introduction of the slimy mucus on the skin.—I am, etc.,

Beccles. H. MUIR EVANS.

[1] Reprinted from *Bull. Hist. Med.*, 1943, **14**, No. 4.

Excision of Patella

SIR,—When Mr. H. A. T. Fairbank writes or speaks, those of us who are younger in years and experience read or listen with respect and affection, for his power of critical analysis blended with a long experience has always contributed to any argument in which he has joined.

Despite my training in the conservative Liverpool School of Orthopaedics, I cannot help feeling that his letter (July 14, p. 62) condemning excision of the patella is a little too sweeping. He concludes the letter by stating, "I am convinced that the best advice one could give a young surgeon would be to learn to suture the fragments of a fractured patella with accuracy and not to resort to excision of the bone in the hope of getting a rapid result." My commentary on this sentence is the following three cases.

In 1929, when I was his registrar, I assisted Mr. Watson-Jones, who is, as everyone knows, a very skilled operator, to suture a simple, transversely fractured patella in a man aged about 60. The immediate result of this operation delighted the patient, the surgeon, and his registrar. Three or four years later I happened to come across the patient while doing an evening surgery for his panel doctor. The man had much pain and crepitus. My disappointment was so great that the case has never left my thoughts whenever the subject of the treatment of a fractured patella has to be discussed.

The second case was a patient of Mr. Ollerenshaw's in 1939, who again had an accurately sutured transverse fracture of the patella. A few months after returning to the comparatively light work of a chauffeur-gardener he slipped and refractured the bone. This is the second disappointment, and although excision was then carried out the poor result cannot be blamed on the excision so much as the fact that he had two traumata and two operations.

The third disappointment was one of my own patients who in 1944 suffered a simple transverse fracture without any separation and was treated conservatively by plaster-of-Paris splintage. Some six months later he had pain and weakness, not due to limitation of movement, but due to arthritis. A skiagram revealed lipping of the articular surfaces of the patella in the line of fracture—i.e., the gliding surface was irregular despite the most perfect position that any surgeon could obtain.

These three cases would never enter into anybody's statistics of end-results because they are distributed among three surgeons, but they suggest that accurate suture of the fragments does not necessarily lead to a good result. These and many other cases force me to accept the fact that, after a patella has been fractured, only a very small number of patients regain a good, strong, fully movable, painless knee; and it is with this background that the results of all forms of treatment must be compared. This apparently pessimistic view will probably be contested. I suggest that it is not pessimistic, but accurate.

When considering whether excision or suture is better we must also realize that in the majority of cases a patient, though possessed of a symptomless knee prior to the fracture, is approaching or has attained the age when *x* rays reveal the bony changes known as osteo-arthritis. In these patients even a simple contusion of the knee without any fracture not infrequently leads to as much pain, weakness, swelling, and sometimes loss of movement as in cases of a fracture.

When a patella is excised for osteo-arthritis or rheumatoid arthritis the patients start off with an already painful, weak, and perhaps stiff knee, and although they know just as well as the critical surgeon that after the operation the knee is not perfect these patients are pleased because they have a good deal

less pain. It is true that some knees are weaker than others after excision of the patella.

I cannot agree with Mr. Fairbank that it is only essential to repair the hole left in the capsule. I regard it as imperative to make what I like to term a "false ligament" joining the lower end of the central portion of the quadriceps tendon and the upper end of the patellar ligament. This false ligament is made up of overlapped and rolled extensor aponeurosis plus silk or thread continuous suture. It is designed to glide over the patellar portion of the femur in order to replace the lost bony pulley, and the more carefully one constructs this ligament the more satisfactory is the voluntary extension of the knee afterwards.

Finally, remembering that the knee cannot ever be as powerful as the undamaged knee, it is important to explain to the patients that no matter what we do to the knee it can never be perfect, but that our treatment will give the best possible result. We must be careful to point out that this partial imperfection will include some weakness. Otherwise we shall have the same story as was told by the first patient whose patella I excised. I regret that I had not then realized the importance of warning the patient of what the future would hold for him. After he had recovered from the immediate injury and operation he went to his trade union's convalescent home at Llandudno for a fortnight, and on his return told with delight how he had been able to climb up the Great Orme. However, a few weeks later he returned, complaining of his inability to walk up and down a flight of stairs at his work. It is not fair to say that he was malingering; but he realized his knee was weak—just as I knew it would have been weak after suturing of the patella—and feeling the economic insecurity that makes life so difficult for all workmen he imagined himself much more disabled than he was in reality.—I am, etc.,

Manchester. W. SAYLE CREER.

SIR,—Mr. Fairbank's letter (July 14, p. 62) with its admirable exposition on the present position of excision of the patella is timely and welcome. I can confirm the results of Mr. Fairbank's experience where so many patients are now classified as *permanently partially disabled* as a result of the operation. The results of immobilization of the bone fragments by suture never produced the disabling results one so often sees following the excision method. I meet so many of the younger inexperienced generation of surgeons who are imbued with the conviction, acquired from textbooks and current literature, that excision of the patella following fracture is the *only* treatment worth considering, and they await with bated breath an opportunity of putting their belief into practice.

In a simple fracture by direct violence with stellate comminution of the patella the bone fragments are usually enclosed in the containing "sheath" limited by the boundaries of the periosteum and articular cartilage; if treated conservatively by rest a good functional result is usually obtained. In my experience it is seldom that bone fragments perforate the "sheath," but if they do so the knee-joint must be opened and the fragments removed.

With a transverse simple fracture caused by muscular violence it is not always appreciated that the aponeurosis fused with the periosteum, covering the subcutaneous surface of the patella, is ruptured at a much lower level than that of the bone fracture. The operation I have done over a long period of years has been the approximation of the fractured bone surfaces by two interrupted chromic catgut sutures of 20 days' absorption, care being taken not to encroach on the articular surface of the patella—i.e., *into* the knee-joint; even as important is the repair of the torn aponeurosis by interrupted catgut sutures. My results have been good. Few have had much limitation of knee-joint movement; in no case has there been a sequel of infective arthritis.

Most elderly doctors can testify to acute disappointments following the premature booming of some new method of treatment, medical or surgical, which subsequent events proved limited in value or worthless. I would make a plea for more restrained optimism where a new surgical operation is advocated without the justification of an ample test-time limit. To mention one such case:

A medical man suffering from a duodenal ulcer had a short-circuiting operation done by a well-known surgeon who had recently returned from a surgical tour in the U.S.A. During his travels the surgeon saw a new type of operation which so appealed to him that he abandoned his old well-tried and successful technique for the new method. The results were disastrous to the patient in question, who, for over 20 years until he died, expressed his disappointment forcibly in these words: "I am the victim of a fashion in surgery; if Mr. 'X.' had only done his ordinary operation and not the new method he saw in the U.S.A. I would not be in the plight I am now in." The surgeon soon returned to his old technique.

Surely it is reasonable to ask that surgical innovations should not be broadcast, and, in particular, not included in teaching textbooks until the operation has been evaluated by some time factor. This could be done under the aegis of a reputable surgical "society," which could refer it to a committee of inquiry; they could arrange for an adequate number of operations to be done, the results checked and finally reported upon after an adequate time has elapsed. Only upon confirmation of results should an account of the new operation be included in a teaching surgical textbook. Of course the surgical society concerned must take care that the originator of the innovation should, on confirmation, be accorded the full credit for the discovery. I have no hesitation in saying that had this procedure been followed in excision of the patella for fracture, a large number of patients—Service men and civilians—would have been spared a severe permanent disability.—I am, etc.,

R. J. WILLAN.

SIR,—Mr. Fairbank states a strong case for the adoption of a conservative, or at any rate a critical, attitude towards excision of the patella, partial or complete, for injury.

I should like strongly to support his conclusions. My reason for so doing is based on a fairly extensive experience of isolated cases and on my observations at a convalescent depot in East Anglia during the period 1942–3. At the latter, at from 2 to 12 months after operation I noted some 13 consecutive cases of complete excision of the patella for fractures. The operations had been carried out by various surgeons in the area. Of the 13 patients, three were returned to duty in Category A, two were boarded as unfit for further service, and the remainder suffered from varying degrees of disability. The disability was usually the result of imperfect control of the final degrees of full, firm extension. These failures may no doubt be attributed to faulty technique or to unsatisfactory after-treatment; the fact remains that it is difficult to assure a perfect result. It was noticeable that even in men with good function the thigh on the side of the excision remained appreciably smaller in circumference than that on the sound side.

In compound injuries, and in some instances of gross comminution, excision may be the best course. In most simple fractures it seems a confession of incompetence on the part of the surgeon to remove a useful bone because he is not mechanic enough so to fix the fragments that approximate restoration to the normal can take place. The application of the term "useful" to the patella may be justified on account of its service in the extensor control of the knee, its protective value, and its cosmetic significance.—I am, etc.,

Oxford. C. MAX PAGE.

Standardization of Instrument Fittings and Apparatus

SIR,—There was some discussion in your columns a short time ago about the advantages which British medicine would enjoy from the adoption of the metric system. Reform is also badly needed in another direction, and that is in the matter of standardization of surgical instrument fittings and apparatus. It is encouraging to note in a recent answer in "Any Questions?" that the standardization of needles and mounts is already on the way (June 30, p. 932). For such standardization to be of value, however, it must find general acceptance, and it is in this sort of thing that totalitarian countries enjoy an advantage. I understand that some years ago the manufacturers in this country were forced to make other sizes to meet foreign competition, having already agreed upon the S.I.M.A. fitting as a standard one. There should be little difficulty over standardization, however, once the profession has appreciated its convenience, or rather its lack of inconvenience.

At present the variety of fittings in use is bewildering, and confusion arises especially in the matter of syringes, cannulae,

and needles, in the bayonet and other fittings for the injection of oily fluids and local anaesthetics, and in intravenous apparatus. An instrument catalogue may illustrate a long series of adaptors to make different sizes of mounts fit different sizes of needles. Such adaptors, moreover, result in clumsiness and an increased risk of leaks, and are very apt to be missing when wanted.

Intravenous infusions of various kinds are now given with great frequency, and with suitable apparatus are simple and safe. It is annoying, however, to find, after successfully inserting a needle into the more or less empty and collapsed vein of a shocked patient, that the available nozzle will not fit the needle, and that a connexion has to be made by threading rubber tubing over the needle. This often results in the needle being forced through or out of the vein, or the delay allows clotting to occur in the lumen of the needle. It may also be found that different types of apparatus are in use for the giving of blood, plasma, saline, and glucose. It is true that with a little ingenuity one type of apparatus may be connected up to another by such measures as inserting needles into tubing, and sometimes it is possible to transfer fluids from one container to another. All this, however, means increased risk, and some recent reports, such as those of fatal air embolism due to transfusion, or fatal sepsis due to the intravenous injection of penicillin, show the risks which already exist in intravenous therapy. All who have used the apparatus standardized by the transfusion services throughout the country since the war will agree that it is remarkably simple and satisfactory to use, and with the improved materials available in peacetime it would be a great convenience if all intravenous fluids could be given with a similar standardized apparatus.

It unfortunately often happens that the ingenuity of inventors and manufacturers produces apparatus which is an improvement on that previously available but which requires replacements and refills of non-standard size. Surely standardization need not curb commercial progress. The time seems suitable for an investigation of the whole problem. Once standard fittings have been introduced, adaptors could continue to be made till existing stocks of non-standard apparatus have been used up.—I am, etc.,

Birkenhead. BRYAN WILLIAMS.

Cerebral Fat Embolism after E.C.T.

SIR,—The case of cerebral fat embolism following electrical convulsion treatment reported by Drs. Meyer and Teare (July 14, p. 42) is of interest, since a somewhat analogous case was reported by A. Karlen (*Acta chir. scand.*, 1942, **87**). Karlen described pulmonary and cerebral fat and marrow embolism in a man of 25 years who had violent convulsions after an injection of "per-abrodil" (a non-oily fluid) into the sacral canal; the man died in a uraemic-like state. Necropsy revealed ruptures and haemorrhages in the abdominal wall muscles, the lumbar and psoas muscles, diaphragm, etc. The muscle ruptures occurred during the convulsions. No fractures were found, but the vertebrae were not examined in detail.

It is known that fractures of the vertebral bodies may occur during severe convulsions, and Karlen was careful to point this out and cited the relevant authorities. Karlen considered that the fat embolism arose from such fractures. Such vertebral fractures may not be evident on inspection; section of the vertebral bodies may be necessary for their detection. Violent convulsions, as in convulsion therapy, may actually cause compression fractures of the vertebrae (see case report by Stalker, *Lancet*, 1938, **2**, 1172). In a series of 51 cases of psychiatric disorders treated by convulsion therapy the incidence of compression fracture of the vertebrae was no less than 43% (Polatin *et al.*, *J. Amer. med. Ass.*, 1939, **112**, 1684).

The post-mortem examination notes of the case reported by Drs. Meyer and Teare state that a careful examination of the spine, etc., was made, but no fracture was detected. Unless the vertebral bodies were sawn through and examined the possibility that a fracture was overlooked cannot be ruled out. It would be of interest, therefore, to have more precise information on this. The point is of interest, since the view has long been held that concussion could give rise to fat embolism. The evidence is slender. In an extended series of investigations over a period of five years I was quite unable to substantiate this view. I have collected a large series of cases of fat embolism; fat embolism was never found without fracture or surgical trauma of bone or trauma of fatty tissues. It is hoped to publish this series of cases shortly.—I am, etc.,

R. DRUMMOND,
Late Assistant Lecturer, Department of Pathology,
Cardiff. Welsh National School of Medicine.

Treatment of Coma

SIR,—The paper on arsenical encephalopathy by Col. Ransome and Capts. Paterson and Gupta (May 12, p. 659) is very valuable. They profess great faith in the treatment of comatose patients by postural "decompression" and advocate it for cerebral malaria, the coma of hyperthermia, arsenical encephalopathy, and perhaps lead encephalopathy. Also they direct that convulsions and restlessness should be "ruthlessly" suppressed. Many years ago I tried nursing cases of obstinate hyperthermic coma in the sitting position, with undoubted improvement as compared with other cases lying down, but with results less brilliant than shown by the authors. As with them the underlying idea was to prevent pulmonary oedema.

Not long ago it was suggested that patients developing anaesthetic convulsions should be treated by raising the head, and almost complete control of the fits was claimed for this method. The upright-sitting position certainly has no effect on the convulsions of hyperthermia, so perhaps they differ from anaesthetic convulsions in causation; but the two conditions have much in common nevertheless.

Ransome, Paterson, and Gupta recommend the use of soluble hexobarbitone for the control of convulsions in the cases of coma treated by them. No doubt this therapy is based on the recognized methods for combating anaesthetic convulsions. I would hesitate to use soluble hexobarbitone in these cases (encephalopathies), for I have seen prolonged coma, uninterrupted except by death, following minor operations in three cases after 1 to 3 grammes of the substance intravenously. I considered this too "ruthless." I have not seen any fatal results after the intravenous administration of evipan sodium, though this was a very popular anaesthetic at one time. In my opinion the inhalation of oxygen from a mask—Cowan and Mitchell type when available—is an invaluable adjunct to other forms of treatment, and the oxygen appears to have an anticonvulsant effect, but prolonged use may be necessary. Oxygen appeared to me to be kinder to the suffering encephalon.

The authors ask for reports from other people on the effect of their postural drainage, which is my excuse for this note. Much of the outstanding success justly claimed by the authors—as they admit—is due to the superb nursing skill enjoyed by their patients.—I am, etc.,

FRANK MARSH.
Pathologist, Anglo-Iranian Oil Company.

Abacterial Pyuria

SIR,—I read with great interest Mr. Hugh Donovan's article on abacterial pyuria (July 7, p. 12), as many cases of this nature presenting a urethral discharge attended my venereal clinics in the Middle East. The efficacy of 0.3 g. N.A.B. once weekly for a few weeks must be seen to be believed, since all other treatments are utterly useless. In my cases the provisional diagnosis was made on the smears obtained showing numerous pus cells and epithelial cells with complete absence of any bacteria combined with the two-glass test, both glasses showing a marked haziness due to pus. Frequency and urgency were often slight in some of my cases. Tuberculosis in my experience is never associated with a urethral discharge, especially in its early manifestations.

With regard to aetiology, I had the opportunity of having several slides stained and examined by experts in virus work, but with negative results. The similarity of some cases of early bilharzia infection and the response to an arsenical has suggested to me some submucous infection of the vesical and urethral mucous membrane. The cases of epididymitis referred to by Mr. Donovan have also in my experience showed no signs of urinary infection, the urine being crystal clear.

One last point I would like to stress is that the time has come when "urethritis," apart from the gonococcal variety, should be classified on a better basis than at present, if only to relieve the minds of our patients suffering from a persistent urethral discharge.—I am, etc.,

Orford, Woodbridge. F. L. LYDON.

Obituary

W. T. GORDON PUGH, M.D., F.R.C.S.

We regret to announce the death on July 22 of Dr. W. T. Gordon Pugh, Chief Medical Superintendent of Children's and Tuberculosis Services, London County Council, and formerly Medical Superintendent of Queen Mary's Hospital for Children at Carshalton.

William Thomas Gordon Pugh was born on April 9, 1872, the son of a civil servant. He was educated at the University College of Wales, and the Middlesex Hospital Medical School, where he gained an entrance scholarship, the Lyell Gold Medal and Scholarship, and the Senior Broderip Scholarship. He took the conjoint qualification of London in 1894, the M.B., B.S. in 1895, the M.D. in 1898, and the F.R.C.S.Eng. in 1935. After appointments as house-physician and house-surgeon at his own hospital he was R.M.O. at Hackney Road Children's Hospital. In 1897 he joined the fever service of the late M.A.B. at the North-Eastern Hospital, and in 1907 was promoted medical superintendent of what is now the Southern Hospital, Dartford. In 1909 he became the first medical superintendent of the newly opened Queen Mary's Hospital for Children, Carshalton, and here he found his life's work. He retired in 1937. Gordon Pugh was at one time president of the Orthopaedic Section of the Royal Society of Medicine, and he was a member of the British Orthopaedic Association. He published many reports and articles on the problems of surgical tuberculosis, and built up and sustained the reputation of Queen Mary's Hospital at Carshalton as one of the most important centres in the country for the treatment of this condition.

W. A. D. writes:

All who knew W. T. Gordon Pugh—and indeed many who did not—will be grieved at the news of his death on July 22. In his particular specialties "Pugh of Carshalton," as he was always known, had achieved international fame.

His great interest lay in the treatment and after-care of children suffering from non-pulmonary tuberculosis and in orthopaedics generally. Queen Mary's Hospital developed under his guidance into the largest children's hospital in the country. It contained 1,284 beds and gave ample opportunity for his unlimited energy. On his transfer to the service of the London County Council in 1930 he had even greater scope for his activities and was an invaluable member of many central committees, particularly that on hospital standards.

It is true to say that Gordon Pugh was beloved by all who came into contact with him—doctors, nurses, other staff, patients and their friends and relatives. His kindness, courtesy, and patience in all things were unfailing. Every year they hold an enormous children's fête at Carshalton. Whilst he was there Pugh was the life and soul of the party; and since his retirement he attended regularly these annual gatherings. At this year's—on July 30—his presence will be sorely missed. He took a great interest in the work of the school for the patients which is part of the hospital. He was the author of a popular book on nursing. He leaves a widow and two children. His son is in the medical service of the Navy, and his daughter is married to a doctor.

We regret to announce the sudden death at the age of 73 of Dr. EDWARD MORRIS of Donington, Lincs. He received his medical education at St. Bartholomew's Hospital and qualified L.S.A. in 1906 and M.R.C.S., L.R.C.P., a year later. After qualifying he held the posts of resident house-physician and resident house-surgeon at St. George's Hospital. He was also house-surgeon at the York Road Lying-in Hospital for Women. Dr. Morris went into general practice at Donington 36 years ago, and during this long period earned the affection and respect of a wide circle of friends and patients in the district. The son of a gentleman-farmer on the border of England and Wales, Dr. Morris had in his early days a great interest in ponies and horses, and when he first practised in Donington used to make his round on horseback. He was keen on and proficient in many branches of sport. Of his family of seven, his son, Dr. Patrick Morris, is practising in the same district.

A colleague writes the following appreciation of Dr. A. W. MATTHEW, whose obituary notice appeared in the *Journal* of July 21: On May 27 Arthur Matthew, senior anaesthetist to St. Mary's Hospital, died suddenly as he was saying good-bye to friends at the Royal National Orthopaedic Hospital. There had been no illness, no premonitory sign, no suggestion that he was not in normal good health. During the last few war years he had often complained of fatigue due to incessant work, which included a large number of night calls, but to those of us who worked with him in the theatre day after day there was no suggestion that he suffered from some mortal lesion. The news of his death came as a great shock to all who work at St. Mary's. Matthew was not only one who administered anaesthetics. He made a careful examination of all his patients before the operation, and also, by his insight into human nature, an accurate assessment of the mental and emotional state. Though the time of his association with his patients was necessarily brief, yet he came to know them and gain their confidence, which made the ordeal of operation something of a quiet, unanxious surrender. Matthew had less interest in the academic side of his work than in its practical application. He spoke and wrote little, but his merit was acknowledged by his colleagues when they elected him President of the Section of Anaesthetics of the Royal Society of Medicine in 1942. All who knew him recognized his professional merit. Those who were fortunate enough to be his friends also knew him as a great, loyal, delightful colleague and companion. The loss to St. Mary's is irreparable, not so much because we have lost a great anaesthetist as because the whole hospital, through all its ranks, has lost a lovable friend.

The Services

The President of the Czechoslovak Republic has conferred the Military Medal (1st Class) on Wing Cmdrs. J. C. Blair, R.A.F., and J. C. Scott, R.A.F.V.R., in recognition of valuable services rendered in connexion with the war.

Temp. Surg. Lieut. D. A. T. Farrar, R.N.V.R., has been mentioned in dispatches for bravery and skill, while serving in one of H.M. ships, in a successful engagement with enemy light forces.

Temp. Surg. Lieut. W. L. Leslie, R.C.N.V.R., has been mentioned in dispatches for courage, tenacity, and great devotion to duty in fire-fighting and rescue work under exceptionally hazardous conditions.

Capt. E. J. Jones, R.A.M.C., has been appointed M.B.E. (Military Division) in recognition of gallant conduct in carrying out hazardous work in a very brave manner.

The following have been mentioned in dispatches in recognition of gallant and distinguished services in Italy: Brig. (Temp.) E. M. Townsend, M.C., and Brig. (Acting) D. G. Cheyne, C.B.E., M.C., late R.A.M.C.; Cols. (Temp.) G. W. R. Bishop, O.B.E., T.D., J. M. Mackenzie, C.B.E., M.C., R. E. Rees, M.C., T.D., and J. T. Robinson; Lieut.-Cols (Temp.) T. M. R. Ahern, W. M. Capper, J. H. Croom, G. Y. Feggetter, R. T. Grant, K. McNeill, O.B.E., H. Mannington, J. S. Miller, T. P. P. Murphy, R. J. Niven, M.C., O. A. Savage, H. L. Sheehan, J. Trotter, O.B.E., R. L. Turner, O.B.E., and H. S. Ward, O.B.E.; Lieut.-Col. (Acting) H. W. L. Nichols, T.D.: Major E. Fowler; Majors (Temp.) D. W. Ashcroft, D. S. Austin, H. M. Barnard, D. Bell, H. Bridges, A. S. Bullough, W. A. Carey, H. J. Croghan, L. F. Dawes, F. H. Edwards, M.C., A. B. Evans, W. R. Everatt, H. K. Fidler, T. E. Field, M.B.E., M. C. K. Finlayson, A. M. Giles, E. H. C. Harper, L. Heasman, G. M. Hobbin, O. P. D. Lawson, W. M. Macleod, K. C. Mallen, R. J. B. McEwen, P. C. Mitchell, M.C., W. F. Nicholson, H. D. O'Brien, R. G. W. Ollerenshaw, P. L. O'Neill, J. D. O'Riordan, A. Orleck, M.B.E., D. L. Owen, M.B.E., J. H. Patterson, A. S. Ramsey, C. G. Rob, M.C., H. L. Settle, R. Thornley, R. A. R. Topping, D. J. D. Torrens, F. E. Wheeler, A. B. White, W. J. Wiles, W. Wilson, and J. Yofe; Major (Acting) P. K. Walker; Capts. J. R. Bennett, D. C. B. Bramwell, A. L. Brown, P. H. Davison, D. S. Dick, E. Greenwood, A. A. Guild, A. M. Gwynn, P. M. James, G. H. P. John, R. M. J. Keir, H. C. Kennedy, H. Levine, R. J. A. Macdonald, M.B.E., J. M. McInroy, L. C. Montgomery, H. B. Morris, H. Mowschenson, K. I. Peckitt, J. Pinching, J. J. Reeks, G. T. Robertson, A. F. Rodger, R. W. Ross, R. Shields, A. M. Stewart, G. B. Tait, V. N. Taylor, and H. D. S. Vellacott; Capts. (Temp.) J. P. Adlam, J. S. Brunton, L. Camrass, F. J. Downes, J. A. J. Hammond, H. G. McQuade, and N. C. Mond; and Lieuts. R. Frame, N. L. Loosmore, D. J. L. Rowland, and E. D. Waters, R.A.M.C. Col. (Temp.) R. L. Raymond, O.B.E.; Lieut.-Cols. (Temp.) V. D'A. Blackburn, A. N. Mackenzie, and T. K. White; Majors (Temp.) H. R. Anand, D. M. Iyer, and H. F. T. Macfetridge, D.S.O.; Capts. H. M. Archibald, S. R. N. Rao, R. Ramachandra, and S. Mukerji; and Lieuts. C. N. Le Tang and L. Siviah, I.A.M.C.

The following have been mentioned in dispatches in recognition of gallant and distinguished services in Burma: Brig. (Temp.) H. G. Winter, M.C., late R.A.M.C.; Brig. (Acting) D. F. Panton; Cols. (Temp.) J. H. Baird (Reserve of Officers), A. O. Bekenn, O.B.E., and J. R. Dawson; Col. (Acting) S. W. K. Arundell; Lieut.-Cols. (Temp.) F. Ayrey, D. H. D. Burbridge, A. Burns, H. Gass, G. B. Heugh, A. J. Martin, T. A. Pace, J. P. Raban, J. R. Steen, D. S. Valentine, and E. J. M. Wenyon; Lieut.-Col. (Acting) S. B. Dimson; Majors (Temp.) K. D. G. Abbott, D. G. Adamson, D. M. Baker, F. I. Evans, P. B. L. Nicholas, P. J. O'Connell, G. W. Pinder, C. I. Raeburn, and G. I. M. Ross; Majors (Acting) R. M. Campbell and J. F. Stokes; Capts. B. E. Camus, S. Citron, P. J. R. Davis, J. W. Doupe, H. W. W. Good, D. R. Gunn, H. L. Hart, J. C. Henry, A. B. J. Hill, L. P. Hodgson, J. C. Jeffrey, E. L. H. Jones, J. C. Leask, J. O'Hara, N. Pedersen, M.C., H. G. Stanton, D. B. Watson, B. G. Wells, and R. B. Wright; and Capt. (Temp.) D. Blacklee, R.A.M.C. Lieut.-Cols. (Temp.) J. H. Arthur, M.B.E., G. B. Jackson, M. L. A. Dewan, J. L. O'Neill, and A. D. Wilson; Majors (Temp.) L. M. Kelly, M.B.E., R. M. Nair, and S. F. Thomas; Major (Acting) S. K. Sen; Capts. J. Aitken, B. Ghosh, B. B. Dutta, C. S. Mendiratta, D. I. Gantzer, A. C. Greene, J. C. Sen, M. K. Akhtar, V. V. S. Mudaliah, E. B. Naug, R. K. Chakravarty, S. R. Ray, S. Sanyal, and S. K. Banerjee; and Lieut. S. C. Dutta, I.M.S. Capt. B. Singh; Lieuts. P. K. S. Chowdhury and T. D. Gera; Subadar D. Mohd, M.B.E., and Jemadar I. Singh, I.A.M.C. Capt. J. R. Audy, E.A.A.M.C.

CASUALTIES IN THE MEDICAL SERVICES

Wounded.—War Subs. Capts. D. R. Hughes, L. G. Kiloh, and F. H. Leckie, M.C., R.A.M.C.

Universities and Colleges

UNIVERSITY OF OXFORD

In Convocation on July 21 the honorary degree of D.Sc. was conferred on Prof. H. M. Turnbull, D.M., F.R.S., F.R.C.P., director of the Pathological Institute of London Hospital.

UNIVERSITY OF CAMBRIDGE

The Marmaduke Sheild Scholarships in human anatomy have been awarded to David Bulmer (Peterhouse) and Rodney Peter Holmes (Trinity College).

UNIVERSITY OF LONDON

The following scholarships, exhibitions, and prizes have been awarded at University College Hospital Medical School.

Goldsmid Entrance Scholarships, Miss J. D. Cross (University College, London), V. E. Amassian (Trinity College, Cambridge). *Goldsmid Entrance Exhibition*, I. W. Broomhead (St. John's College, Cambridge). *Filliter Entrance Scholarship in Pathology*, W. I. N. Kessel (Trinity College, Cambridge). *Atchison Scholarship*, Miss M. E. Hughes. *Magrath Scholarships: Medicine*, O. L. Wade; *Midwifery*, G. F. Jolly; *Surgery*, A. M. H. Bennett. *Erichsen Prize*, T. H. Morgan. *Liston Gold Medal*, D. A. Pyke, C. J. Don. *Alexander Bruce Gold Medal*, P. A. Ring. *Fellowes Gold Medal*, O. L. Wade. *Fellowes Silver Medal*, Miss P. A. Howard. *Wilfred Trotter Medal*, R. H. Hardy. *Tuke Silver Medal*, D. R. Smith. *Tuke Bronze Medal*, G. Loewi. *Suckling Prize in Obstetrics and Gynaecology*, T. H. Powell.

UNIVERSITY OF DURHAM

At a Congregation held on July 11 the following honorary degrees were conferred:

D.Hy.—Sir William Wilson Jameson, K.C.B., M.D., F.R.C.P., Chief Medica Officer, Ministry of Health and Board of Education.

D.Sc.—*Sir Alexander Fleming, F.R.S., F.R.C.S., professor of bacteriology in the University of London.

The following medical and surgical degrees were also conferred:

M.D.—Mary Francis, *J. B. Hartley, *T. C. Studdert.

M.B., B.S.—O. Chandra, P. H. Dickinson, A. C. Dresser, W. J. S. Edington, Catherine J. Lewis, T. Manners, Alice J. Maynecord, J. R. Mirrey, Pinelis Roberts, Dorothy L. Robertson, Margaret B. Shaw, P. G. Thomson, G. R. Wheldon, E. H. Wilken.

* *In absentia.*

UNIVERSITY OF ST. ANDREWS

The following candidates have been approved at the examination indicated:

M.D.—Marjory McFarlane (with distinction and awarded University gold medal), D. R. K. Reid.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH

At a meeting of the College, held on July 17, with the President, Dr. A. Fergus Hewat, in the chair, Dr. Bryce Ramsay Nisbet (Kilmarnock) was introduced and took his seat as a Fellow of the College. Dr. Thomas Addis (San Francisco), Dr. Wm. Kerr Blackie (Salisbury, S. Rhodesia), Dr. Robert Alexander Miller (Grantown-on-Spey), Dr. Alexander James Murray Drennan (Edinburgh), and Dr. Wm. Forbes (Edinburgh) were elected Fellows of the College.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH

At a meeting of the Royal College of Surgeons of Edinburgh, held on July 20, with Prof. R. W. Johnstone, President, in the chair, the following candidates, who have passed the requisite examinations, were admitted Fellows: Denis Charles Bodenham, Roy Theodore Scovel Goodchild, Thomas Labatt Lawson, Michael Lentin, Michael Joseph Murphy, John Alexander Vere Nicoll, John Archibald Simpson, John David Stenstrom, Kenneth Frank Wilsdon.

It was resolved that, to celebrate the victory in Europe, the Honorary Fellowship of the College be conferred upon the following members of the medical profession: Brig.-Gen. Elliott C. Cutler, U.S. Army Medical Service; Andrew Davidson, M.D., Chief Medical Officer, Department of Health for Scotland; Surg. Vice-Admiral Sir Sheldon F. Dudley, K.C.B., M.D., F.R.S., F.R.C.P., Medical Director-General of the Navy; Major-Gen. Paul R. Hawley, U.S. Army Medical Service; Mr. Eardley L. Holland, M.D., F.R.C.S., President, Royal College of Obstetricians and Gynaecologists; Dr. Johan Holst, Professor of Surgery in the University of Oslo; Sir Alfred Webb-Johnson, K.C.V.O., C.B.E., D.S.O., President of the Royal College of Surgeons of England; Sir Edward Mellanby, K.C.B., M.D., F.R.S., F.R.C.P., Secretary, Medical Research Council; and Air Marshal Sir Harold E. Whittingham, K.C.B., K.B.E., F.R.C.P., Director-General of Medical Services, Royal Air Force.

SOCIETY OF APOTHECARIES OF LONDON

At a recent meeting of the Court of Assistants, with the Master, Dr. J. P. Hedley, in the chair, the deaths of Sir Stanley Woodwark, Immediate Past Master, Sir Buckston Browne, Honorary Freeman and Diplomate, and Viscount Dawson of Penn, Honorary Freeman, were announced with regret.

The following were appointed to represent the Society on the bodies named: Dr. J. P. Hedley on the Central Midwives Board; Mr. L. Vernon Cargill on the Research Board for the Correlation of Medical Science and Physical Education; Surg. Rear-Admiral C. P. G. Wakeley on the British Postgraduate Medical School.

The following served on the Strickland Goodall Memorial Lecture Committee: The Master, Dr. J. P. Hedley, and Dr. Geoffrey Bourne; Prof. T. R. Elliott, nominated by the Royal Society; Dr. George Graham, nominated by the Royal College of Physicians of London; and Surg. Rear-Admiral G. Gordon-Taylor, President of the Royal Society of Medicine. Dwight Emary Harken, licentiate of the Society, was appointed as fourth lecturer and delivered a lecture entitled "Foreign Bodies in Relation to the Great Vessels and Heart" in the Hall on June 26.

Sir Wilson Jameson and Prof. W. D. Newcomb were reappointed adjudicators for the Gillson Scholarship in Pathology, which was awarded to John Llewellyn Penistan for 1945.

The following were clothed by the Master with the Livery of the Society: Alistair Livingston Gunn, Joah Lyon Bates, Frank Doria Pitt Palmer, John Macmillan Mennell, Jack Naylor Hunt, Robert Hutton Bembridge.

The following were admitted to the freedom of the Society: By Redemption—Archibald Daniel Marston, Reginald Hibbert Boardman, Licentiate, Ernest Forbes Roberts; by Servitude—Archibald Walker Banks, Solomon Shubsachs.

George Millington Woodwark and William Henry Dealtry Fairbank, apprentices of the late Sir Stanley Woodwark, were turned over to Sir Hugh Lett and Surg. Rear-Admiral Wakeley, respectively, for the remainder of their terms.

James Anthony Whillis was bound apprentice to James Whillis for 7 years; and Peter Relf Dearman to Edward James Dearman for 4 years.

The Diploma of the Society was granted upon examination to S. R. Abrams, W. McC. Anderson, I. M. Atallah, T. C. G. Barnes, D. I. Chapman, A. St. J. Dixon, E. G. Field, W. I. M. Gibson, W. B. Harman, S. D. Holloway, A. G. Hucker, K. E. Lewis, M. MirFakhrai, A. R. McWhan, D. D. Rosewarne, C. R. P. Sheen, A. G. I. Stuckley, J. Wotton, E. W. Wright.

CONJOINT BOARD IN SCOTLAND

The following candidates, having passed the final examinations, have been admitted L.R.C.P.Ed., L.R.C.S.Ed., and L.R.F.P.&S.Glasg.: N. J. W. Allan, E. Barnet, B. O. Barry J. A. W. Brown, P. F. Cassidy, Eileen V. A. Clarke, T. D. Duke, W. W. Fulton, H. Gardner, R. R. Gilfillan, J. J. Hogan, Evelyn M. Lafferty, B. Lake, I. R. Lambah, J. Littlejohn, D. Livingstone, I. Mackenzie, B. G. Madhoo, V. St. J. de C. Magian, S. H. Manners, A. Mather, W. S. Millar, A. D. Moffat, J. A. Narcisse, E. R. M. Nicol, S. Pearson, W. R. Sadler, P. Seltzer, G. Verghese, Margaret W. M. Young.

A. Heymann, M.D.Wurzburg, a graduate of a recognized foreign university, was also admitted a licentiate.

Medical News

The British Medical Association is advertising for two Assistant Secretaries as well as for a Scottish Secretary. It is allowing a four-months period to intervene between the advertisement and the last day for applications in order that Service candidates at home or over-seas shall have opportunity to apply. The Scottish Secretary will take up his duties on Jan. 1, 1946, or on demobilization, and the Assistant Secretaries on Feb. 1, 1946, or on demobilization.

Mr. Justice Macnaghten, allowing an appeal by the Crown from a decision of the Commissioners for the Special Purposes of the Income Tax Acts, on July 27 decided that the National Anti-Vivisection Society were not entitled to exemption from income tax under Section 37 (1) of the Income Tax Act, 1918.

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Dr. John Chancellor McKenzie, O.B.E., retired last month from the post of Commissioner of Medical Services, Ministry of Pensions, Edinburgh, and was succeeded by Dr. John Wilson McCagie. On his retirement the staff of the Ministry entertained Dr. McKenzie, and a presentation was made to him by the Chief Regional Officer.

Mr. T. E. A. Stowell, M.D., F.R.C.S., member of the Council of the Industrial Welfare Society, has been elected First Vice-president of the International Association for Life-Saving and First Aid to the Injured.

Capt. R. D. Marett Tims, L.M.S.S.A., has been appointed Officer (Brother) in the Order of the Hospital of St. John of Jerusalem (*corrected announcement*).

EPIDEMIOLOGICAL NOTES

Discussion of Table

In *England and Wales* the only variations of any size were falls in measles (469) and diphtheria (36), and a rise in whooping-cough (48).

In Yorks West Riding the notifications of whooping-cough rose by 35, and of diphtheria fell by 21. In contrast to the general fall in measles, rises occurred in Essex (82) and Norfolk (51). A slight rise in measles was also recorded in the south-west, where the regional total increased by 32.

Dysentery notifications fell by 4. The chief centres of infection were London 47, Lancashire 32, Warwickshire 15, Essex 14, Middlesex 13.

In *Scotland* a general fall was reported in the incidence of infectious diseases. The largest decreases were scarlet fever (71), primary pneumonia (34), measles (31), diphtheria (10). Dysentery remained at the level of the preceding week; the largest returns for this disease were Glasgow (11) and Falkirk (11).

In *Eire* a further rise in infantile diarrhoea and enteritis was reported, 65 of the 68 cases occurring in Dublin C.B. Whooping-cough, with a rise of 27, was the only other disease that showed any large variation in trend.

In *Northern Ireland* only 5 cases of diphtheria were notified and none of measles.

Quarterly Return for Northern Ireland

The birth rate for the March quarter was 22.2 per 1,000, this being 1.1 below that for the first quarter of 1944, but 0.7 above the average of the five March quarters 1940–4. The infant mortality was 95, compared with 93 for the five-years average, and 85 for the first quarter of 1944. Maternal mortality was 2.0 per 1,000 births, and half the average rate for the corresponding quarter of the five preceding years. The general death rate was 15.9 per 1,000, being 0.3 above the rate for the March quarter of 1944 but 1.3 below the average first-quarter rate for 1940–4. Eighty-seven infant deaths were attributed to diarrhoea and enteritis, this being 23 above the average. Deaths from pulmonary tuberculosis and from other forms numbered 249 and 68 respectively, and 19 and 14 below the five-year average. Deaths from measles, whooping-cough, and diphtheria were 14, 27, 13, compared with 36, 27, 29 for the average of the five preceding March quarters.

Week Ending July 21

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 1,254, whooping-cough 1,158, diphtheria 444, measles 3,475, acute pneumonia 350, cerebrospinal fever 45, dysentery 249, paratyphoid 9, typhoid 9, poliomyelitis 16.

No. 28

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended July 14.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1945 (a)	(b)	(c)	(d)	(e)	1944 (Corresponding Week) (a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	52	4	20	—	5	59	4	20	5	1
Deaths		—	2				1	—		
Diphtheria	422	24	86	71	5	491	24	89	74	8
Deaths	7	—	1	—	—	3	2	—	—	1
Dysentery	206	47	47	1	—	156	9	68	1	—
Deaths				—	—				—	—
Encephalitis lethargica, acute	4	—	—	—	—	4	—	—	—	—
Deaths		—					—			
Erysipelas		—	30	4	3		1	25	5	1
Deaths										
Infective enteritis or diarrhoea under 2 years				68					14	
Deaths	34	3	4	14	1	41	3	13	6	—
Measles*	4,075	207	46	33	—	2,536	130	61	130	35
Deaths	3	—	2	—	—	2	1	—	—	—
Ophthalmia neonatorum	51	4	8	—	—	65	3	11	—	—
Deaths										
Paratyphoid fever	9	—	2(B)	—	—	7	—	3(B)	—	—
Deaths	—	—	—	—	—	—	—	—	—	—
Pneumonia, influenzal†	387	23	9	5	3	437	25	4	—	2
Deaths (from influenza)	8	2	—	—	—	11	1	—	—	1
Pneumonia, primary		17	131	14			20	118	19	
Deaths				10	5				6	5
Polio-encephalitis, acute	1	—				3	—			
Deaths		—					—			
Poliomyelitis, acute	12	4	1	2	—	16	1	4	—	—
Deaths		—					—			
Puerperal fever		4	8		—		—	11		—
Deaths										
Puerperal pyrexia‡	123	4	13	—	—	141	6	6	1	1
Deaths		—					1			
Relapsing fever	1	—			—	—	—			—
Deaths										
Scarlet fever	1,303	74	153	21	37	1,394	56	167	22	58
Deaths	1	—	—	—	1	1	1	—	—	—
Smallpox	—	—	—	—	—	—	—	—	—	—
Deaths				—	—				—	—
Typhoid fever	10	2	2	5	1	8	—	2	10	—
Deaths	1	—	—	—	—	—	—	—	—	—
Typhus fever	—	—	1	—	—	—	—	—	—	—
Deaths				—	—				—	—
Whooping-cough*	1,098	69	14	51	8	2,323	181	56	25	11
Deaths	4	—	—	—	—	4	1	3	—	1
Deaths (0–1 year)	286	23	28	29	11	284	35	63	31	11
Infant mortality rate (per 1,000 live births)										
Deaths (excluding still-births)	3,815	561	482	197	92	4,163	830	542	165	95
Annual death rate (per 1,000 persons living)			10·9	12·7	§			12·5	10·7	§
Live births	6,892	792	822	426	205	7,389	838	958	366	242
Annual rate per 1,000 persons living			16·4	27·5	§			19·5	23·7	§
Stillbirths	203	21	15			205	10	30		
Rate per 1,000 total births (including stillborn)			18					30		

* Measles and whooping-cough are not notifiable in Scotland, and the returns are therefore an approximation only.

† Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

‡ Includes puerperal fever for England and Wales and Eire.

§ Owing to movements of population, birth and death rates for Northern Ireland are still not available.

Letters, Notes, and Answers

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 2111. TELEGRAMS: *Aitiology Westcent, London.* ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.

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MEMBERS' SUBSCRIPTIONS should be sent to the SECRETARY of the Association. TELEPHONE: EUSTON 2111. TELEGRAMS: *Medisecra Westcent, London.*

B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

ANY QUESTIONS?

Diphtheria Immunization in Asthmatic Child

Q.—*Two children, aged 7 and 9, were immunized 5 years ago with T.A.M. What would you advise as a boosting injection? One child is asthmatic. Is there any fear of undue reaction if A.P.T. is used? Would you advise combining with whooping-cough prophylactic vaccine?*

A.—Children aged 7 and 9 years should not be given a boosting dose of A.P.T. without a preliminary Schick test, to which they may give a pseudo-positive reaction indicative of an increased sensitivity to diphtheria toxoid. In such cases an injection of A.P.T., or indeed of any diphtheria antigen, may evoke a rather severe reaction. T.A.F. is often used for the immunization of older children and adults, but T.A.F. contains a small amount of a foreign protein and is therefore not to be recommended for use in an asthmatic child. If the Schick test is positive without any pseudo-reaction, a small dose (0.2 c.cm.) of A.P.T. should be used. If the test is pseudo-positive no further immunization should be attempted; instead, the Schick test should be repeated in 3 to 6 months' time, when it will often have become negative in pseudo-reactors. Immunization against pertussis in children of this age is scarcely advisable, since they are past the age of greatest susceptibility; besides, the large doses of pertussis vaccine usually recommended may produce undesirable reactions in an asthmatic child.

Sulphonamides for B. coli Infections

Q.—*Are any of the recent sulpha drugs, such as sulphamezathine, likely to prove effective against old-standing B. coli recurrent cystitis? Stock and autogenous vaccines have been tried and found useless. Mandelates after a number of courses over many years are losing their effect. Wash-outs and other urinary antiseptics have been of only temporary assistance.*

A.—It is not clear from the question whether treatment with any of the sulphonamides has yet been tried. If not, the instructions for the treatment of urinary-tract infections in *The Medical Use of Sulphonamides* (M.R.C. War Mem. No. 10) should be followed. It is almost impossible to say, without an actual *in vitro* test of the patient's own organism, which of the newer sulphonamide compounds is likely to be the most effective. Sulphathiazole is on the whole more active than sulphanilamide, and has been found to act well in quite small doses, such as 0.2 gramme 4 times a day. Sodium bicarbonate should be given in addition, in order to keep the *p*H of the urine slightly on the alkaline side of neutrality. An advantage of sulphamezathine is that owing to its greater solubility larger doses can be given without risk of crystalline deposition in the urinary tract; this drug might be tried in doses of 1 gramme 4 times a day if others fail.

Treatment of Asthma

Q.—*What is the most modern and best treatment for a patient during an asthmatic attack?*

A.—The patient should be sent to bed, preferably a bed with kapok pillows and rubber mattress and in a bedroom with as little as possible in the way of carpets, rugs, drapery, and other sources of dust. Encouragement and reassurance may greatly help the nervous patient. The physician should place his hands on the front of the chest and encourage the patient to empty the lungs, rather than strive vainly to expand them even further. An initial subcutaneous injection of 3 to 5 minims of 1 in 1,000 solution of adrenaline hydrochloride should be given. This may be repeated at half-hourly intervals, and if relief is still not obtained the syringe may be strapped in position and the adrenaline injected continuously at the rate of 1 minim a minute. Injection of adrenaline may be supplemented or replaced by inhalation of the drug; 1 in 100 solution is used for this purpose. The mouthpiece of the nebulizer is inserted in the mouth and one or two puffs are inhaled at the moment of deep inspiration. If adrenaline fails, the physician may try pituitary extract, 0.5 to 1.0 c.cm. intramuscularly; theophylline with ethylene diamine (aminophylline), 0.25 to 0.5 gramme in 10 c.cm. of water, very slowly intravenously; or pethidine hydrochloride, 100 mg. intramuscularly. It is possible that pethidine shares the disadvantages of morphine, and it should be used with care. Inhalation of oxygen, or oxygen and helium, may be of value if the attack is protracted.

In conclusion, there is nothing very modern about present-day therapy of the asthmatic paroxysm, for adrenaline has been used since the beginning of the century. The best treatment is early treatment; the longer treatment is delayed, the more likely the attack is to become prolonged and intractable. Finally, treatment should not be regarded as over when the paroxysm is relieved. It is, in fact, only just begun, and every effort must then be made to discover the factors which have excited the paroxysm and to remove or remedy them if possible.

Pituitary Extract for Herpes Zoster

Q.—*It has been stated that herpes zoster has been successfully treated by pituitary extract. Has this method of treatment been extensively tried, and with what result?*

A.—The reference in the *Extra Pharmacopoeia* (Martindale) is to a paper by S. H. Portnoy, "Some Experiences with Posterior Pituitary Solution in Herpes Zoster," published in the *J. Med. Cincinnati* (1938, **18,** 619). Files of this journal are apparently not available in this country. The treatment of herpes zoster by pituitrin was introduced by Vandel in 1923. In 1930 Sidlick (*Arch. Derm. Syph.*, Chicago, 1930, **22,** 91) reported favourable results in a series of 54 cases. The duration of the disease before treatment varied from 24 hours to 5 weeks. Many of the patients obtained relief of pain after one injection, but a number required three and one required six. There were apparently no failures, and Sidlick described the treatment as "most efficient." Niles (*N.Y. St. J. Med.*, 1932, **32,** 773) compared 16 cases of herpes zoster treated with pituitrin and an equal number of controls receiving other treatments. He concluded that the course of the illness was shortened and the severe pain usually accompanying it was generally rapidly relieved by pituitrin injections. Niles's series included one man aged 70 with post-herpetic neuralgia, and he was not relieved. Gillett, who reported in the *Lancet* (1934, **2,** 307) a group of 3 cases treated with pituitrin, concluded that it acted best when the pain was more intense, but that relief was uncertain and not infallible. The treatment is mentioned in more recent books and periodicals, but no other extensive trial has been found in the literature available.

Testosterone in Angina Pectoris

Q.—*Recent clinical trials suggest that testosterone propionate exerts a favourable effect on the symptoms, if not on the course, of angina pectoris. Is this so, and what is the scheme of dosage? What, if any, are the side-effects from the use of this drug, and is previous cardiac infarction a contraindication? One or two recent references would be appreciated.*

A.—Testosterone propionate has been used for the treatment of angina pectoris, and very favourable results have been recorded. The rationale of the treatment is by no means clear. Walker concludes that there is a direct vasodilator action, since this therapy was found by him to be effective in peripheral vascular disease. In animals testosterone produces hypertrophy of the heart muscle. It might also be argued that arterial degeneration occurs in later life when gonadal function is decreased, and that testosterone would tend to retard or reverse such effects. The dosage is 50 mg. injected intramuscularly twice or thrice weekly. There are unlikely to be any side-effects from this treatment. Recent cardiac infarction, however, should probably be regarded as a contraindication. The two references are: Walker, T. C., *J. clin. Endocrinol.*, 1942, **11,** 560; Lesser, M. A., *New Engl. J. Med.*, 1942, **226,** 51.

Fox-Fordyce Disease

Q.—*Is there any cure for Fox-Fordyce disease, and if not, what is the best remedy for the irritation?*

A.—Fox-Fordyce disease, characterized by an itchy eruption of small red or skin-coloured papules, is fortunately a rarity, because treatment often entirely fails. The primary changes are located in the apocrine glands, and therefore *x*-ray treatment may help by its selective action on them; the secondary lichenization is also beneficially affected by *x*-ray treatment.

Doctors' Expectation of Life

Q.—*What is the expectation of life of a medical man at the age of (a) 60 and (b) 65?*

A.—It is not possible to answer this question, as no life table has been compiled on the mortality of the medical profession. It is certain that the expectation of life would be less than that for all

Medical News

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No. 28

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A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1945 (a)	(b)	(c)	(d)	(e)	1944 (Corresponding Week) (a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	52	4	20	—	5	59	4	20	5	1
Deaths		—	2				1	—		
Diphtheria	422	24	86	71	5	491	24	89	74	8
Deaths	7	—	1	—	—	3	2	—	—	1
Dysentery	206	47	47	1	—	156	9	68	1	—
Deaths				—	—				—	—
Encephalitis lethargica, acute	4	—	—	—	—	4	—	—	—	—
Deaths		—					—			
Erysipelas		—	30	4	3		1	25	5	1
Deaths										
Infective enteritis or diarrhoea under 2 years				68					14	
Deaths	34	3	4	14	1	41	3	13	6	—
Measles*	4,075	207	46	33	—	2,536	130	61	130	35
Deaths	3	—	2	—	—	2	1	—	—	—
Ophthalmia neonatorum	51	4	8	—	—	65	3	11	—	—
Deaths										
Paratyphoid fever	9	—	2(B)	—	—	7	—	3(B)	—	—
Deaths	—	—	—	—	—	—	—	—	—	—
Pneumonia, influenzal†	387	23	9	5	3	437	25	4	—	2
Deaths (from influenza)	8	2	—	—	—	11	1	—	—	1
Pneumonia, primary			131	14				118	19	
Deaths		17		10	5		20		6	5
Polio-encephalitis, acute	1	—				3	—			
Deaths		—					—			
Poliomyelitis, acute	12	4	1	2	—	16	1	4	—	—
Deaths		—					—			
Puerperal fever		4	8		—		—	11		—
Deaths										
Puerperal pyrexia‡	123	4	13	—	—	141	6	6	1	1
Deaths		—					1			
Relapsing fever	1	—			—	—	—			—
Deaths										
Scarlet fever	1,303	74	153	21	37	1,394	56	167	22	58
Deaths	1	—	—	—	1	1	1	—	—	—
Smallpox	—	—	—	—	—	—	—	—	—	—
Deaths				—	—				—	—
Typhoid fever	10	2	2	5	1	8	—	2	10	—
Deaths	1	—	—	—	—	—	—	—	—	—
Typhus fever	—	—	1	—	—	—	—	—	—	—
Deaths				—	—				—	—
Whooping-cough*	1,098	69	14	51	8	2,323	181	56	25	11
Deaths	4	—	—	—	—	4	1	3	—	1
Deaths (0–1 year)	286	23	28	29	11	284	35	63	31	11
Infant mortality rate (per 1,000 live births)										
Deaths (excluding stillbirths)	3,815	561	482	197	92	4,163	830	542	165	95
Annual death rate (per 1,000 persons living)			10·9	12·7	§			12·5	10·7	§
Live births	6,892	792	822	426	205	7,389	838	958	366	242
Annual rate per 1,000 persons living			16·4	27·5	§			19·5	23·7	§
Stillbirths	203	21	15			205	10	30		
Rate per 1,000 total births (including stillborn)			18					30		

* Measles and whooping-cough are not notifiable in Scotland, and the returns are therefore an approximation only.

† Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

‡ Includes puerperal fever for England and Wales and Eire.

§ Owing to movements of population, birth and death rates for Northern Ireland are still not available.

Letters, Notes, and Answers

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 2111. TELEGRAMS: *Aitiology Westcent, London.* ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.

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MEMBERS' SUBSCRIPTIONS should be sent to the SECRETARY of the Association. TELEPHONE: EUSTON 2111. TELEGRAMS: *Medisecra Westcent, London.*

B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

ANY QUESTIONS?

Diphtheria Immunization in Asthmatic Child

Q.—*Two children, aged 7 and 9, were immunized 5 years ago with T.A.M. What would you advise as a boosting injection? One child is asthmatic. Is there any fear of undue reaction if A.P.T. is used? Would you advise combining with whooping-cough prophylactic vaccine?*

A.—Children aged 7 and 9 years should not be given a boosting dose of A.P.T. without a preliminary Schick test, to which they may give a pseudo-positive reaction indicative of an increased sensitivity to diphtheria toxoid. In such cases an injection of A.P.T., or indeed of any diphtheria antigen, may evoke a rather severe reaction. T.A.F. is often used for the immunization of older children and adults, but T.A.F. contains a small amount of a foreign protein and is therefore not to be recommended for use in an asthmatic child. If the Schick test is positive without any pseudo-reaction, a small dose (0.2 c.cm.) of A.P.T. should be used. If the test is pseudo-positive no further immunization should be attempted; instead, the Schick test should be repeated in 3 to 6 months' time, when it will often have become negative in pseudo-reactors. Immunization against pertussis in children of this age is scarcely advisable, since they are past the age of greatest susceptibility; besides, the large doses of pertussis vaccine usually recommended may produce undesirable reactions in an asthmatic child.

Sulphonamides for B. coli Infections

Q.—*Are any of the recent sulpha drugs, such as sulphamezathine, likely to prove effective against old-standing B. coli recurrent cystitis? Stock and autogenous vaccines have been tried and found useless. Mandelates after a number of courses over many years are losing their effect. Wash-outs and other urinary antiseptics have been of only temporary assistance.*

A.—It is not clear from the question whether treatment with any of the sulphonamides has yet been tried. If not, the instructions for the treatment of urinary-tract infections in *The Medical Use of Sulphonamides* (M.R.C. War Mem. No. 10) should be followed. It is almost impossible to say, without an actual *in vitro* test of the patient's own organism, which of the newer sulphonamide compounds is likely to be the most effective. Sulphathiazole is on the whole more active than sulphanilamide, and has been found to act well in quite small doses, such as 0.2 gramme 4 times a day. Sodium bicarbonate should be given in addition, in order to keep the *p*H of the urine slightly on the alkaline side of neutrality. An advantage of sulphamezathine is that owing to its greater solubility larger doses can be given without risk of crystalline deposition in the urinary tract; this drug might be tried in doses of 1 gramme 4 times a day if others fail.

Treatment of Asthma

Q.—*What is the most modern and best treatment for a patient during an asthmatic attack?*

A.—The patient should be sent to bed, preferably a bed with kapok pillows and rubber mattress and in a bedroom with as little as possible in the way of carpets, rugs, drapery, and other sources of dust. Encouragement and reassurance may greatly help the nervous patient. The physician should place his hands on the front of the chest and encourage the patient to empty the lungs, rather than strive vainly to expand them even further. An initial subcutaneous injection of 3 to 5 minims of 1 in 1,000 solution of adrenaline hydrochloride should be given. This may be repeated at half-hourly intervals, and if relief is still not obtained the syringe may be strapped in position and the adrenaline injected continuously at the rate of 1 minim a minute. Injection of adrenaline may be supplemented or replaced by inhalation of the drug; 1 in 100 solution is used for this purpose. The mouthpiece of the nebulizer is inserted in the mouth and one or two puffs are inhaled at the moment of deep inspiration. If adrenaline fails, the physician may try pituitary extract, 0.5 to 1.0 c.cm. intramuscularly; theophylline with ethylene diamine (aminophylline), 0.25 to 0.5 gramme in 10 c.cm. of water, very slowly intravenously; or pethidine hydrochloride, 100 mg. intramuscularly. It is possible that pethidine shares the disadvantages of morphine, and it should be used with care. Inhalation of oxygen, or oxygen and helium, may be of value if the attack is protracted.

In conclusion, there is nothing very modern about present-day therapy of the asthmatic paroxysm, for adrenaline has been used since the beginning of the century. The best treatment is early treatment; the longer treatment is delayed, the more likely the attack is to become prolonged and intractable. Finally, treatment should not be regarded as over when the paroxysm is relieved. It is, in fact, only just begun, and every effort must then be made to discover the factors which have excited the paroxysm and to remove or remedy them if possible.

Pituitary Extract for Herpes Zoster

Q.—*It has been stated that herpes zoster has been successfully treated by pituitary extract. Has this method of treatment been extensively tried, and with what result?*

A.—The reference in the *Extra Pharmacopoeia* (Martindale) is to a paper by S. H. Portnoy, "Some Experiences with Posterior Pituitary Solution in Herpes Zoster," published in the *J. Med. Cincinnati* (1938, **18**, 619). Files of this journal are apparently not available in this country. The treatment of herpes zoster by pituitrin was introduced by Vandel in 1923. In 1930 Sidlick (*Arch. Derm. Syph.*, Chicago, 1930, **22**, 91) reported favourable results in a series of 54 cases. The duration of the disease before treatment varied from 24 hours to 5 weeks. Many of the patients obtained relief of pain after one injection, but a number required three and one required six. There were apparently no failures, and Sidlick described the treatment as "most efficient." Niles (*N.Y. St. J. Med.*, 1932, **32**, 773) compared 16 cases of herpes zoster treated with pituitrin and an equal number of controls receiving other treatments. He concluded that the course of the illness was shortened and the severe pain usually accompanying it was generally rapidly relieved by pituitrin injections. Niles's series included one man aged 70 with post-herpetic neuralgia, and he was not relieved. Gillett, who reported in the *Lancet* (1934, **2**, 307) a group of 3 cases treated with pituitrin, concluded that it acted best when the pain was more intense, but that relief was uncertain and not infallible. The treatment is mentioned in more recent books and periodicals, but no other extensive trial has been found in the literature available.

Testosterone in Angina Pectoris

Q.—*Recent clinical trials suggest that testosterone propionate exerts a favourable effect on the symptoms, if not on the course, of angina pectoris. Is this so, and what is the scheme of dosage? What, if any, are the side-effects from the use of this drug, and is previous cardiac infarction a contraindication? One or two recent references would be appreciated.*

A.—Testosterone propionate has been used for the treatment of angina pectoris, and very favourable results have been recorded. The rationale of the treatment is by no means clear. Walker concludes that there is a direct vasodilator action, since this therapy was found by him to be effective in peripheral vascular disease. In animals testosterone produces hypertrophy of the heart muscle. It might also be argued that arterial degeneration occurs in later life when gonadal function is decreased, and that testosterone would tend to retard or reverse such effects. The dosage is 50 mg. injected intramuscularly twice or thrice weekly. There are unlikely to be any side-effects from this treatment. Recent cardiac infarction, however, should probably be regarded as a contraindication. The two references are: Walker, T. C., *J. clin. Endocrinol.*, 1942, **11**, 560; Lesser, M. A., *New Engl. J. Med.*, 1942, **226**, 51.

Fox-Fordyce Disease

Q.—*Is there any cure for Fox-Fordyce disease, and if not, what is the best remedy for the irritation?*

A.—Fox-Fordyce disease, characterized by an itchy eruption of small red or skin-coloured papules, is fortunately a rarity, because treatment often entirely fails. The primary changes are located in the apocrine glands, and therefore *x*-ray treatment may help by its selective action on them; the secondary lichenization is also beneficially affected by *x*-ray treatment.

Doctors' Expectation of Life

Q.—*What is the expectation of life of a medical man at the age of (a) 60 and (b) 65?*

A.—It is not possible to answer this question, as no life table has been compiled on the mortality of the medical profession. It is certain that the expectation of life would be less than that for all

males, since the ratio of the death rate to that of all males, for ages 45–54, 55–64, 65–69, is 108, 111, 103. The standardized mortality ratio for medical men aged 20–65 is 106 and ranks in the 123rd position in a list of 200 occupations tabulated by the Registrar-General.

Splitting of Nail Edge

Q.—*What are the cause and treatment of frequent splitting of the nail edge parallel to the free border?*

A.—In a healthy person the nail grows continuously from its root at the rate of 1 mm. per week; the proximal half-inch is supported by the underlying tissues, but the extreme distal portion is unsupported and readily betrays any inherent weakness by breaking under slight trauma. Any condition which adversely affects those cells in the nail-bed which manufacture the nail-substance will lead to a weakness in the transverse section being made at that time, though it may be many weeks before that section will reach the end of the nail, where it will be more subject to trauma. A transverse ridge indicating the affected section will sometimes be seen (Beau's line).

Brittleness of the nail (onychorrhexis) may be a congenital defect, and has been known to occur in several consecutive generations. Most cases, however, are due to pathological conditions which affect the root of the nail. Any serious illness or injury may lead to the formation of a weak section of nail which will prove brittle when it reaches the termination of the nail. Constitutional disease such as gout is said to lead to the formation of brittle nails, and thyroid insufficiency may produce the same result. General skin diseases such as psoriasis, eczema, and lichen planus sometimes affect the nail and may make it brittle. In the case of ladies the repeated application of nail varnish, and its removal by solvents such as acetone, may make the nail more friable, and the same result may follow frequent washing of the hands in hot water, especially in a hot alkaline solution. Some have claimed that a deficiency of iron in the system may produce brittle nails.

Treatment depends upon the cause, which should be diagnosable after a consideration of the foregoing. If no cause can be found, the nail should be carefully and regularly trimmed, and trauma avoided. It has been recommended to paint the weak nails with collodion, but in bad cases it would probably be better to wear a protecting glove whenever possible.

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Q.—*Why is cowpox virus no longer used in this country for immunization against smallpox?*

A.—The use of cowpox virus in the prophylactic immunization against smallpox has been abandoned because we have a very suitable alternative agent for the purpose in vaccinia virus. Vaccinia virus is a fixed variant of smallpox virus made by adapting the latter virus to growth in the tissue of the calf. Direct variolization of the calf is usually unsuccessful, but the work of the Royal Commission on Vaccination (1889–97) showed how this could be done, and that the fixed variant of smallpox virus so produced—vaccinia virus—could be freed from contaminating bacteria kept in an active state by storage in glycerol. Glycerinated calf lymph came into general use for the purpose of vaccination against smallpox when this procedure was made compulsory in this country in 1898. Some people have assumed the identity of cowpox and vaccinia viruses, but the work of Downie has shown that although the two are closely allied they can be distinguished by serological and other means.

Frigidity in a Woman

Q.—*A young married woman since her marriage has not felt any sexual impulses, although her husband has normal relations with her. She is a sensible type of girl, very fond of him. No abnormality has been detected, although she had to have a plastic operation on the vulva performed by a specialist after her marriage. During coitus there has never been any vaginal secretion.*

A.—This is a big question, for there are so many causes of sexual frigidity, and these are sometimes obscure. We can only suggest some types.

Constitutional.—Some women are obviously more constitutionally highly sexed than others, depending largely on the endocrine secretions, and this in the absence of anything which may be called disease. If it is true that the pituitary is the initiator of sexual feeling, then one might look to the gonadotrophic secretion as the cause. The "lanky" subgonadal type is a case in point. There is the further fact, which we may regard as biological, that there are many apparently normal and happily married women who never have an orgasm, and the idea that women in general are just as highly sexed as men is, after all, probably a fallacy. They do, however, have a greater need of, and capacity for, love, since they themselves need protection whilst they protect the offspring.

Of *psychological* causes the possibility of a conditioned reflex has first to be considered. Many women, previously normally sexed, who after marriage have an incompletely ruptured hymen and suffer pain may thereafter cease to have any desire, although the cause of the pain is removed. One would like to know the reason for the operation on the vulva in this case, and whether there being "something wrong there" inhibited the free expression of libido. Another present-day cause is the relations with the husband. A woman with a previous romantic attachment to some other man may be "very fond" of her husband, but can never completely yield herself to him, as she is not fully in love with him; or she may be a mother to him. It may, however, be necessary to look for deeper and more unconscious causes. Though she is now "sensible" about sex, she may have inhibitions about sex due to early training or an infantile taboo regarding some sexual activity. Threats of punishment may lead to the inhibition of sex, producing a conscious guilt or fear of sex. Again, an early external masturbation, especially if it is continued over puberty, sometimes prevents the libido from passing into the vagina, in which case ordinary coitus will have no effect. But sometimes it may be merely a matter of posture, for we have known some women who have no sex feeling except with coitus *a posteriori*. A woman who as a child was given enemata may be so disposed; and this, after all, is the natural approach in animals. These are some of the causes of frigidity, from which it will be seen that the specific cause in any case may need sex investigation at the hands of an expert.

LETTERS, NOTES, ETC.

Speech Training

Dr. L. M. M. BEADNELL writes: I would like to protest against the inaccuracy of the term "speech therapy" now coming into use. Shock therapy is not treatment of shock, but treatment of other conditions by means of shock; the same applies to malaria therapy, occupational therapy, etc. Surely the word intended is "speech *training*."

Spraying Enclosed Spaces

Mr. N. E. HICKIN, Ph.D. (Bletchingley, Surrey) writes: In your issue of July 14 the question was asked, "Is paraffin or kerosene the best solvent for the spraying of enclosed spaces, such as mess-decks?"; and the answer is given that kerosene is about the most satisfactory carrier liquid for insecticides available at present. I wish to disagree most strongly with this contention. By far the best medium for conveying insecticides to enclosed spaces is water; and it would be agreed that this is even cheaper and more readily available, with even lower toxicity to man, than kerosene, and I have carried out numerous experiments on the insecticidal value of water-borne insecticides with the bed-bug and other infesting insects as the test insect. Several highly concentrated and officially recommended insecticides, such as the lethanes, are available in emulsified form which only require added water to dilute to the necessary strength for spraying, and it will be appreciated that these sprays are absolutely non-inflammable, and, so far as the bed-bug is concerned, equal in insecticidal value to the same concentration of lethane dissolved in kerosene.

*** We have submitted the above to the expert who gave the answer, and he writes: There are minor disadvantages in the use of water as a domestic insecticide base (effect of damp on wall-paper, etc., tendency to rust iron spray-guns) just as there are other objections to paraffin (smell and slight fire risk). But the major reason for advocating paraffin is that the majority of effective insecticides are soluble in oils and not in water. It is, of course, possible to emulsify them; but dilute emulsions are seldom stable, and there are obvious disadvantages in preparing dilutions before every use of a spray-gun. Emulsions, too, are usually more viscous and therefore more difficult to atomize. Finally, it is usually believed that kerosene has some slight insecticidal value of its own; and while it may be true that a certain insecticide applied as an emulsion is as toxic as the same concentration in kerosene solution, we know of little or no published evidence on the subject.—ED., *B.M.J.*

Viper Antivenenes

Dr. J. E. J. PALSER (Allen and Hanburys Ltd., London, E.2) writes: In his valuably informative paper on adder-bite in England and Wales (July 7, p. 13) Dr. C. W. Walker refers to the importance of the prognosis in view of a complete lack of all European viper antivenenes. We should like to mention that our branch at 7, Vere Street, London, W.1 (Tel. Mayfair 2216), has a stock, though very restricted, of snake-bite serum—*Sérum Antivenimeux E.R.* (Pasteur). This antivenene is prepared from horses which have been immunized against the venom of European snakes, and it is imported into this country because of its efficacy against the bite of the adder (*Vipera berus*). We supply it in vials of 10 c.cm.—i.e., one dose—at 10s. 6d. As, however, the stock is at present so limited, we should be much obliged if medical practitioners would order the serum for immediate use only, not for storage. On request, we should be pleased to send it by the quickest possible means.

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL
LONDON SATURDAY AUGUST 4 1945

British Medical Association

ANNUAL REPRESENTATIVE MEETING, LONDON, 1945

The Annual Representative Meeting opened at the B.M.A. House, London, on Tuesday, July 24, and was continued on the two following days. It was presided over by Dr. PETER MACDONALD, with Dr. J. B. MILLER in the deputy chair, and they were supported by Mr. H. S. Souttar (President), Dr. H. Guy Dain (Chairman of Council), Dr. J. W. Bone (Treasurer), and the officials of the Association.

FIRST DAY

Tuesday, July 24

The meeting opened at 2 p.m.

Standing Orders

On a motion by Dr. D. H. S. BOYD (Reading) it was agreed that the standing orders should be amended so that motions by Divisions and Branches which called for reports on matters referred to Council should be placed on the agenda before approval was given to reports of Council.

Dr. A. C. DE B. HELME (Guildford) further moved that either the action taken on all motions and amendments referred to Council should be published with the Council's report or representatives should be informed of such action. He said the idea was that representatives should know before the meeting what had been done by the Council concerning the matters referred to it.

The CHAIRMAN OF COUNCIL (Dr. Dain) said that there was considerable misapprehension as to what the Council did with motions passed by the Representative Body. All such motions were considered carefully and the results of such consideration were to be found in the Annual Report. During the last twelve months a Representative Meeting had been called to consider the action of the Negotiating Committee, of which the Association was only a part, and motions had been passed to the Negotiating Committee for consideration, and if necessary for action, and no report had been made to the representatives. The reason for this absence of a report was, in the majority of cases, that this stage of the matter had not yet been reached by the Negotiating Committee; when it was reached a report would be made. Since the Special Representative Meeting there had been no opportunity to carry the negotiations any further, and so there were no further reports. It was not that the motions had been ignored.

Dr. HELME said that he was not suggesting for a moment that the Council neglected its business, but representatives did want to know what action had been taken on their motions, and, equally, if no action had been taken.

The Guildford amendment was carried.

Dr. C. M. SCOTT (Barnet) moved that a representative having a motion or amendment on the agenda should have the right to speak to, and demand a vote on, his motion, except when motions to pass to the next business or that the question be now put had been accepted by the Chairman and agreed to by a two-thirds majority. He was anxious that the position should not again arise whereby whole pages of motions were wiped out on a statement from the Chair that they had been already covered.

The CHAIRMAN pointed out that the result of this would be that the same subject-matter on similar motions would come up over and over again, and the time of the meeting would be occupied most unreasonably. Once the general principle had been determined it was surely in order to rule as covered such motions and amendments as were of the same tenor although of slightly different wording.

The CHAIRMAN OF COUNCIL said that it was the custom of the Representative Body to set out all motions on the agenda but to ask members in charge of specific motions to speak to the motion selected for putting to the meeting. He thought it a better procedure than the one followed by some other large bodies in which a committee decided what motions should be submitted, with the result that perhaps three-fourths of them never reached the agenda paper at all.

The amendment was lost.

PRELIMINARY BUSINESS

The CHAIRMAN OF COUNCIL (Dr. Guy Dain) moved the reception of the Annual Report of Council under "Preliminary" and the Supplementary Report under various headings. The work in connexion with the National Health Service, he said, had largely disturbed the ordinary procedure, and no doubt further special meetings would be necessary in the future to consider the progress of the negotiations, but he would like to call attention to the amount of other business which had been carried on. Within the last week the membership had passed the 50,000 mark. (Applause.) An effort was being made to establish relations with the medical associations of countries on the Continent, and it was hoped to set up an international body analogous to the International Labour Office, but to deal with medical questions, when conditions became more stable. A number of experts in different fields of health had come together and produced a very useful book, *A Charter for Health*, which would be ready for publication, it was hoped, in September. So much emphasis had been placed recently on organization and administration that people might lose sight of the fact that health did not depend primarily upon medicine or medical organization, but that good wages, good surroundings, fresh air, good food, and recreation were all essential to health before the doctor ever came in.

The General Practice Committee had done much to improve rates and conditions for doctors doing all kinds of general practice work for Government Departments. The General Practice Committee and the Insurance Acts Committee had produced evidence to put before the Spens Committee, which was dealing with the range of income of general practitioners. The Public Health Committee had asked for a revision of the Askwith scale, which regulated the salaries of medical officers of health. The Ophthalmic Group had produced a report on the Eye Service which was an example of what could be done in that way. The Journal Committee was dealing with the starting of new scientific journals, covering various fields of medicine.

The Council was taking up the question of the efficiency of medical auxiliaries. It was to be hoped that the Government would recognize that such a body as the Board of Registration of Medical Auxiliaries was essential to secure the competence of the various auxiliary services.

Election of President

It was agreed with acclamation that Mr. H. S. Souttar be elected President of the Association.

Representation of Services on Council

Major-General R. W. D. Leslie and Air Marshal Sir Victor Richardson were elected to the Council to represent respectively the R.A.M.C. and the medical branch of the R.A.F.

The General Practitioner and Medical Education

Dr. W. D. STEEL (Worcester) moved as a rider to the preliminary part of the Report:

> That the Medical Education Committee be asked to investigate the part which general practitioners can take in the medical education of the prospective general practitioner.

General practice, he said, was brushed aside in the Goodenough report with only two or three references, but demanded better treatment. At present it was not necessary for a specialist to have taken part, even for a short time, in general practice, although a little experience of general practice would make him a better specialist. No part of the syllabus of instruction dealt with the work of the general practitioner, but it would be of tremendous advantage if medical students could have some instruction from a general practitioner of experience. There

males, since the ratio of the death rate to that of all males, for ages 45–54, 55–64, 65–69, is 108, 111, 103. The standardized mortality ratio for medical men aged 20–65 is 106 and ranks in the 123rd position in a list of 200 occupations tabulated by the Registrar-General.

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A.—This is a big question, for there are so many causes of sexual frigidity, and these are sometimes obscure. We can only suggest some types.

Constitutional.—Some women are obviously more constitutionally highly sexed than others, depending largely on the endocrine secretions, and this in the absence of anything which may be called disease. If it is true that the pituitary is the initiator of sexual feeling, then one might look to the gonadotrophic secretion as the cause. The "lanky" subgonadal type is a case in point. There is the further fact, which we may regard as biological, that there are many apparently normal and happily married women who never have an orgasm, and the idea that women in general are just as highly sexed as men is, after all, probably a fallacy. They do, however, have a greater need of, and capacity for, love, since they themselves need protection whilst they protect the offspring.

Of *psychological* causes the possibility of a conditioned reflex has first to be considered. Many women, previously normally sexed, who after marriage have an incompletely ruptured hymen and suffer pain may thereafter cease to have any desire, although the cause of the pain is removed. One would like to know the reason for the operation on the vulva in this case, and whether there being "something wrong there" inhibited the free expression of libido. Another present-day cause is the relations with the husband. A woman with a previous romantic attachment to some other man may be "very fond" of her husband, but can never completely yield herself to him, as she is not fully in love with him; or she may be a mother to him. It may, however, be necessary to look for deeper and more unconscious causes. Though she is now "sensible" about sex, she may have inhibitions about sex due to early training or an infantile taboo regarding some sexual activity. Threats of punishment may lead to the inhibition of sex, producing a conscious guilt or fear of sex. Again, an early external masturbation, especially if it is continued over puberty, sometimes prevents the libido from passing into the vagina, in which case ordinary coitus will have no effect. But sometimes it may be merely a matter of posture, for we have known some women who have no sex feeling except with coitus *a posteriori*. A woman who as a child was given enemata may be so disposed; and this, after all, is the natural approach in animals. These are some of the causes of frigidity, from which it will be seen that the specific cause in any case may need sex investigation at the hands of an expert.

LETTERS, NOTES, ETC.

Speech Training

Dr. L. M. M. BEADNELL writes: I would like to protest against the inaccuracy of the term "speech therapy" now coming into use. Shock therapy is not treatment of shock, but treatment of other conditions by means of shock; the same applies to malaria therapy, occupational therapy, etc. Surely the word intended is "speech *training*."

Spraying Enclosed Spaces

Mr. N. E. HICKIN, Ph.D. (Bletchingley, Surrey) writes: In your issue of July 14 the question was asked, "Is paraffin or kerosene the best solvent for the spraying of enclosed spaces, such as mess-decks?"; and the answer is given that kerosene is about the most satisfactory carrier liquid for insecticides available at present. I wish to disagree most strongly with this contention. By far the best medium for conveying insecticides to enclosed spaces is water; and it would be agreed that this is even cheaper and more readily available, with even lower toxicity to man, than kerosene, and I have carried out numerous experiments on the insecticidal value of water-borne insecticides with the bed-bug and other infesting insects as the test insect. Several highly concentrated and officially recommended insecticides, such as the lethanes, are available in emulsified form which only require added water to dilute to the necessary strength for spraying, and it will be appreciated that these sprays are absolutely non-inflammable, and, so far as the bed-bug is concerned, equal in insecticidal value to the same concentration of lethane dissolved in kerosene.

*** We have submitted the above to the expert who gave the answer, and he writes: There are minor disadvantages in the use of water as a domestic insecticide base (effect of damp on wall-paper, etc., tendency to rust iron spray-guns) just as there are other objections to paraffin (smell and slight fire risk). But the major reason for advocating paraffin is that the majority of effective insecticides are soluble in oils and not in water. It is, of course, possible to emulsify them; but dilute emulsions are seldom stable, and there are obvious disadvantages in preparing dilutions before every use of a spray-gun. Emulsions, too, are usually more viscous and therefore more difficult to atomize. Finally, it is usually believed that kerosene has some slight insecticidal value of its own; and while it may be true that a certain insecticide applied as an emulsion is as toxic as the same concentration in kerosene solution, we know of little or no published evidence on the subject.—ED., *B.M.J.*

Viper Antivenenes

Dr. J. E. J. PALSER (Allen and Hanburys Ltd., London, E.2) writes: In his valuably informative paper on adder-bite in England and Wales (July 7, p. 13) Dr. C. W. Walker refers to the importance of the prognosis in view of a complete lack of all European viper antivenenes. We should like to mention that our branch at 7, Vere Street, London, W.1 (Tel. Mayfair 2216), has a stock, though very restricted, of snake-bite serum—*Sérum Antivenimeux E.R.* (Pasteur). This antivenene is prepared from horses which have been immunized against the venom of European snakes, and it is imported into this country because of its efficacy against the bite of the adder (*Vipera berus*). We supply it in vials of 10 c.cm.—i.e., one dose—at 10s. 6d. As, however, the stock is at present so limited, we should be much obliged if medical practitioners would order the serum for immediate use only, not for storage. On request, we should be pleased to send it by the quickest possible means.